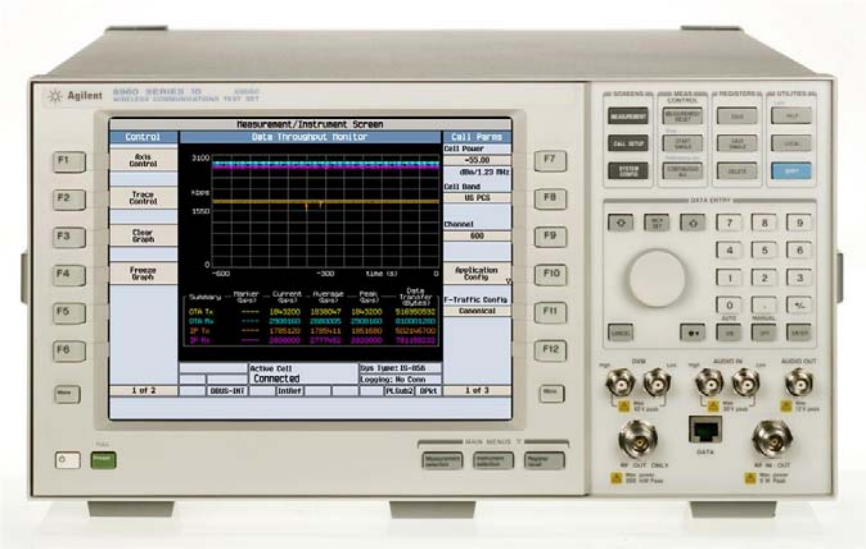
Agilent Technologies



8960
Wireless Communications Test Set
Performance Test

Introduction

The following sections outline general procedures for performance testing the Agilent 8960 series test set over its range of test applications. Specific instrument settings for either the test set or the other instruments in the test setups are not given; only the test methodology is given. The test methodology described is that used by Agilent Technologies for its automatic performance tests. It is also recommended that the functional verification tests and the call processing checks be run to test those functions that don't have associated specifications.

Required Test Equipment:

- Agilent 11095A 600 Ohm Feed-thru
- Agilent 11667A Power Splitter
- Agilent 11636A/B Power Divider/Combiner
- Agilent 3458A Digital Voltmeter
- Agilent E4412A ECP Power Sensor
- Agilent 86205A Directional Coupler
- Agilent 8903B Audio Analyzer With CCITT Weighting Filter
- Agilent E-Series Power Meter
- Agilent ESG-D Series Signal Generator (up to 2GHz)
- Agilent ESG-DP Series Signal Generator (up to 3GHz)
- Agilent Performance Spectrum Analyzer (PSA)

The tests and the corresponding test applications tested are:

Test Applications / Performance Tests Required

The test applications and their corresponding performance tests:

Test	AMPS 136	GSM	C2K	1xEV	WCDMA **HSPA**	Anite
RF Gen FM Distortion 1 GHz and 2 GHz	X		X			
RF Gen Residual FM	X		X			
RF Gen FM Accuracy	X		X			
RF Gen Level Accuracy	X	X	X	X		
Harmonics	X	X	X	X		
Spurious	X	X	X	X		
RF An Level Accuracy	X	X	X	X		
RF An FM Accuracy	X		X			
AF Gen Residual Distortion	X	X	X	X	X	
AF Gen Level Accuracy	X	X	X	X	X	
AF An Level Accuracy	X	X	X	X	X	
AF An Distortion and SINAD	X		X		X	
TDMA Gen Modulation Performance	X					
TDMA An Modulation Performance	X					
TDMA An Residual Modulation	X					
TDMA An IQ Tuning	X					
TDMA An Adjacent Chl Pwr Accuracy	X					
GSM Gen Modulation Performance		X				
GSM An Modulation Performance		X				
GSM An IQ Tuning		X				
GSM Output RF Spectrum (ORFS)		X				
C2K Gen Modulation Performance			X			
C2K An Modulation Performance			X			
C2K/1xEV Gen Channel Pwr Accuracy			X	X		
C2K An Average Pwr Accuracy			X			
C2K An Tuned Channel Pwr Accuracy			X			
1xEV Gen Modulation Performance				X		
1xEV An Modulation Performance				X		
1xEV An Tuned Chl Pwr Accuracy				X		
WCDMA/HSPA Gen Dig Pwr Accuracy					X	
WCDMA Gen Modulation Performance					X	
WCDMA An Level Accuracy					X	
WCDMA ACLR Residual					X	
WCDMA ACLR Accuracy					X	
WCDMA An Modulation Performance					X	
AA Gen Modulation Accuracy						X
AA Spurious						X
AA Gen Level Non-Hopping						X
AA An Level Accuracy						X
AA Gen Level Hopping Accuracy						X
AA BER Residual						X

Performance Test Procedures

RF Generator FM Distortion

Overview:

This procedure tests the FM distortion of the RF generator. FM distortion is tested for the following technologies:

- **TDMA** 1GHz and 2GHz
- **CDMA2000** 1GHz only

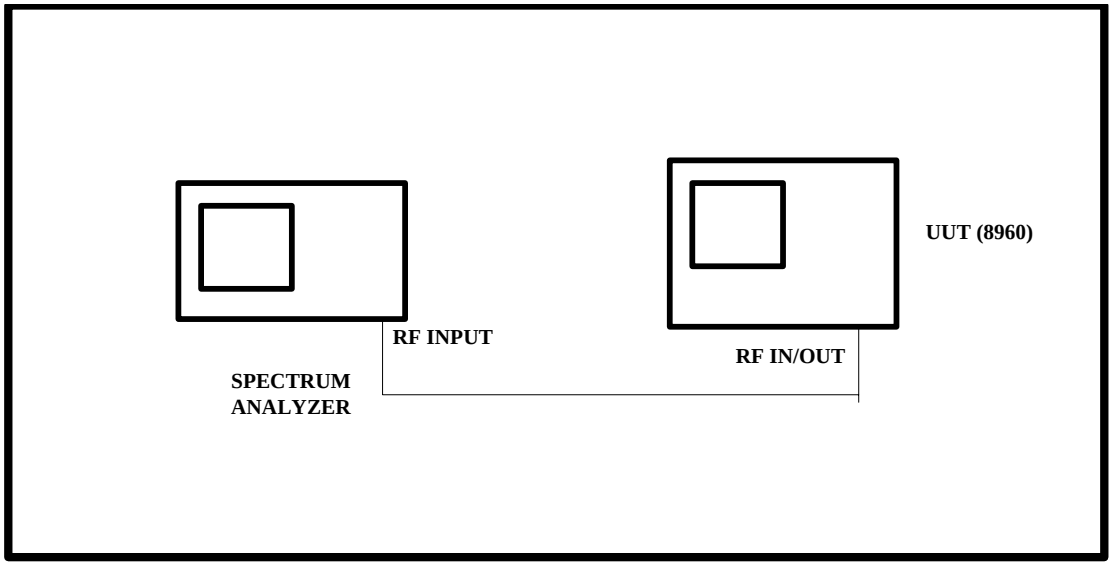
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with Measuring Receiver Option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together.

Test Methodology:

An FM signal is generated with the 8960. The rate, deviation, frequency and power level are specified in the Performance Test Data Points section. The PSA spectrum analyzer is used to demodulate the input signal and PSA is set to measuring receiver mode to make an FM distortion measure for each data points.

RF GENERATOR FM DISTORTION 1 GHz

Test Conditions	Maximum
1 kHz Mod Rate	
800 MHz Carrier	
4 kHz Deviation	0.50
20 kHz Deviation	0.50
990 MHz Carrier	
4 kHz Deviation	0.50
20 kHz Deviation	0.50

RF GENERATOR FM DISTORTION 2 GHz

Test Conditions	Maximum
1 kHz Mod Rate	
1700 MHz Carrier	
4 kHz Deviation	0.50
20 kHz Deviation	0.50
2000 MHz Carrier	
4 kHz Deviation	0.50
20 kHz Deviation	0.50

RF Generator Residual FM

Overview:

This procedure tests the Residual FM of the RF generator. Residual FM is tested for the following technologies:

- **TDMA** 1GHz and 2GHz
- **CDMA2000** 1GHz only

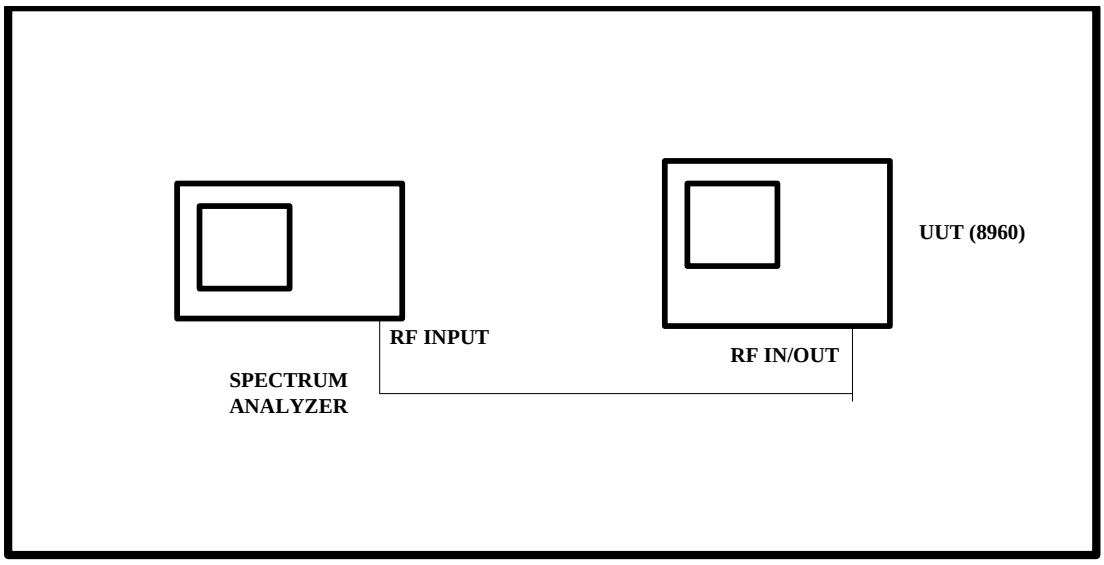
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with Measuring Receiver Option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together.

Test Methodology:

Setup the 8960 to generate a RF signal of frequency and power determined by the data point being measured. The signal should be an FM signal with 0Hz deviation (a CW signal). The PSA spectrum analyzer is used to demodulate the input signal, and PSA is set to measuring receiver mode, make an FM deviation measure for each data points.

RF GENERATOR RESIDUAL FM

Test Conditions	Maximum
-20 dBm	
800 MHz Carrier	7
900 MHz Carrier	7
960 MHz Carrier	7
1700 MHz Carrier	7
1800 MHz Carrier	7
1900 MHz Carrier	7
2000 MHz Carrier	7

RF Generator FM Accuracy

Overview:

This procedure tests the accuracy of the FM modulator. FM accuracy is tested for the following technologies:

- **TDMA**
- **CDMA2000**

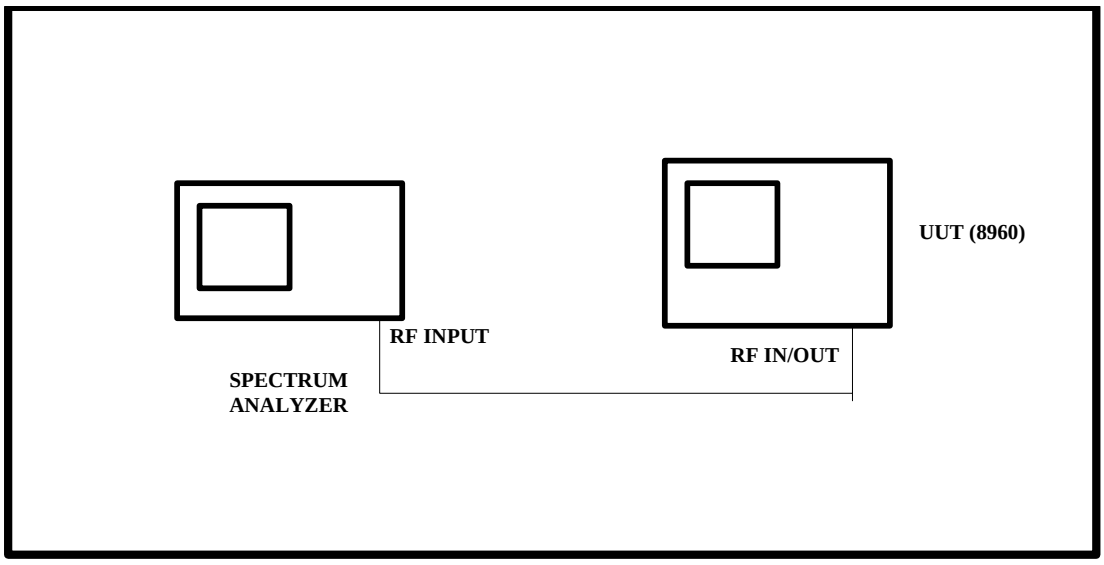
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with Measuring Receiver Option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together.

Test Methodology:

Setup the 8960 to generate an FM signal with given rate, deviation, frequency and power. The PSA spectrum analyzer is used to demodulate the input signal, and PSA is set to measuring receiver mode, make an FM deviation measure for each data points.

RF Generator FM Accuracy Data Points

Test Conditions	Minimum	Maximum
Internal Source		
1kHz Mod Rate		
800 MHz Carrier		
0.5 kHz Deviation	0.4825	0.5175
5 kHz Deviation	4.825	5.175
20 kHz Deviation	19.30	20.70
855 MHz Carrier		
0.5 kHz Deviation	0.4825	0.5175
5 kHz Deviation	4.825	5.175
20 kHz Deviation	19.30	20.70
955 MHz Carrier		
0.5 kHz Deviation	0.4825	0.5175
5 kHz Deviation	4.825	5.175
20 kHz Deviation	19.30	20.70
1700 MHz Carrier		
0.5 kHz Deviation	0.4825	0.5175
5 kHz Deviation	4.825	5.175
20 kHz Deviation	19.30	20.70
1800 MHz Carrier		
0.5 kHz Deviation	0.4825	0.5175
5 kHz Deviation	4.825	5.175

20 kHz Deviation	19.30	20.70
2000 MHz Carrier		
0.5 kHz Deviation	0.4825	0.5175
5 kHz Deviation	4.825	5.175
20 kHz Deviation	19.30	20.70

RF Generator Level Accuracy

Overview:

This procedure tests the power level accuracy of the RF generator. RF level accuracy is tested for the following technologies:

- **GSM**
- **TDMA**
- **CDMA2000**

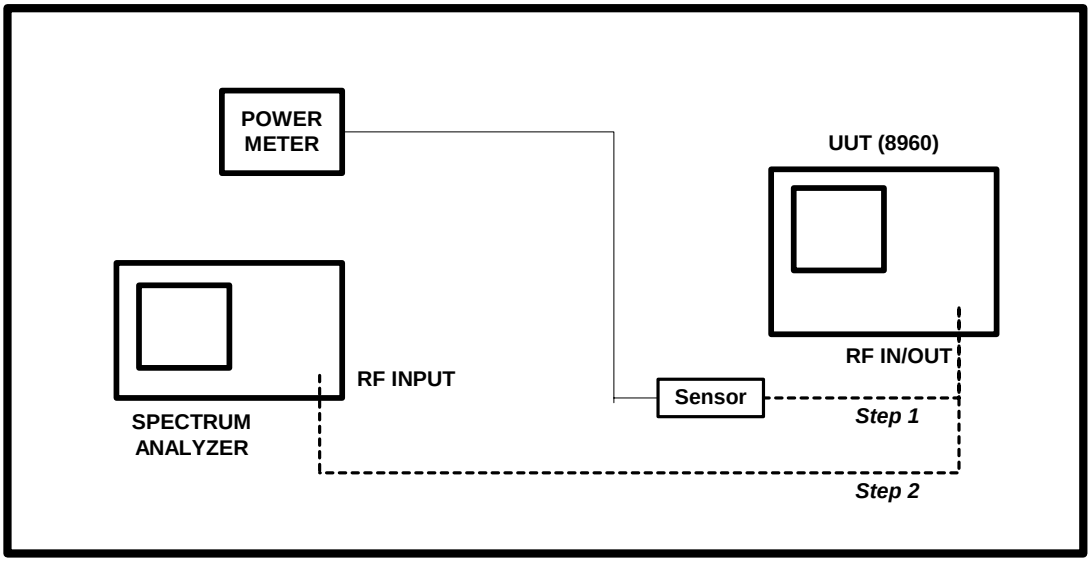
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer
- Agilent E-Series Power Meter
- Agilent E4412A Power Sensor

Connect ID:

- POWER METER CONNECT
- SPECTRUM ANA CONNECT

Setup:



Test Methodology:

The level accuracy of the 8960's RF generator is measured directly with Power Meter and PSA. Power Meter is used to measure the higher power level points

and PSA is used to measure the lower level points. And at the separated point (-29dBm), Power Meter and PSA both make measure and the difference between the two readings, as a cal result, will be passed down to the test points below.

RF Generator Level Accuracy Data Points

RF Generator Level Accuracy		
Test Conditions	Minimum	Maximum
Source 1		
850 MHz Carrier		
-14.00 dBm	-15.00	-13.00
-19.00 dBm	-20.00	-18.00
-24.00 dBm	-25.00	-23.00
-29.00 dBm	-30.00	-28.00
-34.00 dBm	-35.00	-33.00
-39.00 dBm	-40.00	-38.00
-44.00 dBm	-45.00	-43.00
-49.00 dBm	-50.00	-48.00
-54.00 dBm	-55.00	-53.00
-59.00 dBm	-60.00	-58.00
-64.00 dBm	-65.00	-63.00
-69.00 dBm	-70.00	-68.00
-74.00 dBm	-75.00	-73.00
-79.00 dBm	-80.00	-78.00
-84.00 dBm	-85.00	-83.00
-89.00 dBm	-90.00	-88.00
-94.00 dBm	-95.00	-93.00
-99.00 dBm	-100.00	-98.00
-104.00 dBm	-105.00	-103.00
-109.00 dBm	-110.00	-108.00
950 MHz Carrier		
-14.00 dBm	-15.00	-13.00
-19.00 dBm	-20.00	-18.00
-24.00 dBm	-25.00	-23.00
-29.00 dBm	-30.00	-28.00
-34.00 dBm	-35.00	-33.00
-39.00 dBm	-40.00	-38.00
-44.00 dBm	-45.00	-43.00
-49.00 dBm	-50.00	-48.00
-54.00 dBm	-55.00	-53.00
-59.00 dBm	-60.00	-58.00
-64.00 dBm	-65.00	-63.00
-69.00 dBm	-70.00	-68.00
-74.00 dBm	-75.00	-73.00
-79.00 dBm	-80.00	-78.00
-84.00 dBm	-85.00	-83.00
-89.00 dBm	-90.00	-88.00
-94.00 dBm	-95.00	-93.00
-99.00 dBm	-100.00	-98.00
-104.00 dBm	-105.00	-103.00
-109.00 dBm	-110.00	-108.00
Source 2		
850 MHz Carrier		
-14.00 dBm	-15.00	-13.00
-19.00 dBm	-20.00	-18.00
-24.00 dBm	-25.00	-23.00

RF Generator Level Accuracy		
Test Conditions	Minimum	Maximum
-29.00 dBm	-30.00	-28.00
-34.00 dBm	-35.00	-33.00
-39.00 dBm	-40.00	-38.00
-44.00 dBm	-45.00	-43.00
-49.00 dBm	-50.00	-48.00
-54.00 dBm	-55.00	-53.00
-59.00 dBm	-60.00	-58.00
-64.00 dBm	-65.00	-63.00
-69.00 dBm	-70.00	-68.00
-74.00 dBm	-75.00	-73.00
-79.00 dBm	-80.00	-78.00
-84.00 dBm	-85.00	-83.00
-89.00 dBm	-90.00	-88.00
-94.00 dBm	-95.00	-93.00
-99.00 dBm	-100.00	-98.00
-104.00 dBm	-105.00	-103.00
-109.00 dBm	-110.00	-108.00
950 MHz Carrier		
-14.00 dBm	-15.00	-13.00
-19.00 dBm	-20.00	-18.00
-24.00 dBm	-25.00	-23.00
-29.00 dBm	-30.00	-28.00
-34.00 dBm	-35.00	-33.00
-39.00 dBm	-40.00	-38.00
-44.00 dBm	-45.00	-43.00
-49.00 dBm	-50.00	-48.00
-54.00 dBm	-55.00	-53.00
-59.00 dBm	-60.00	-58.00
-64.00 dBm	-65.00	-63.00
-69.00 dBm	-70.00	-68.00
-74.00 dBm	-75.00	-73.00
-79.00 dBm	-80.00	-78.00
-84.00 dBm	-85.00	-83.00
-89.00 dBm	-90.00	-88.00
-94.00 dBm	-95.00	-93.00
-99.00 dBm	-100.00	-98.00
-104.00 dBm	-105.00	-103.00
-109.00 dBm	-110.00	-108.00
Source 1		
1800 MHz Carrier		
-14.00 dBm	-15.00	-13.00
-19.00 dBm	-20.00	-18.00
-24.00 dBm	-25.00	-23.00
-29.00 dBm	-30.00	-28.00
-34.00 dBm	-35.00	-33.00
-39.00 dBm	-40.00	-38.00
-44.00 dBm	-45.00	-43.00
-49.00 dBm	-50.00	-48.00
-54.00 dBm	-55.00	-53.00
-59.00 dBm	-60.00	-58.00
-64.00 dBm	-65.00	-63.00
-69.00 dBm	-70.00	-68.00
-74.00 dBm	-75.00	-73.00
-79.00 dBm	-80.00	-78.00

RF Generator Level Accuracy		
Test Conditions	Minimum	Maximum
-84.00 dBm	-85.00	-83.00
-89.00 dBm	-90.00	-88.00
-94.00 dBm	-95.00	-93.00
-99.00 dBm	-100.00	-98.00
-104.00 dBm	-105.00	-103.00
1900 MHz Carrier		
-14.00 dBm	-15.00	-13.00
-19.00 dBm	-20.00	-18.00
-24.00 dBm	-25.00	-23.00
-29.00 dBm	-30.00	-28.00
-34.00 dBm	-35.00	-33.00
-39.00 dBm	-40.00	-38.00
-44.00 dBm	-45.00	-43.00
-49.00 dBm	-50.00	-48.00
-54.00 dBm	-55.00	-53.00
-59.00 dBm	-60.00	-58.00
-64.00 dBm	-65.00	-63.00
-69.00 dBm	-70.00	-68.00
-74.00 dBm	-75.00	-73.00
-79.00 dBm	-80.00	-78.00
-84.00 dBm	-85.00	-83.00
-89.00 dBm	-90.00	-88.00
-94.00 dBm	-95.00	-93.00
-99.00 dBm	-100.00	-98.00
-104.00 dBm	-105.00	-103.00
Source 2		
1800 MHz Carrier		
-14.00 dBm	-15.00	-13.00
-19.00 dBm	-20.00	-18.00
-24.00 dBm	-25.00	-23.00
-29.00 dBm	-30.00	-28.00
-34.00 dBm	-35.00	-33.00
-39.00 dBm	-40.00	-38.00
-44.00 dBm	-45.00	-43.00
-49.00 dBm	-50.00	-48.00
-54.00 dBm	-55.00	-53.00
-59.00 dBm	-60.00	-58.00
-64.00 dBm	-65.00	-63.00
-69.00 dBm	-70.00	-68.00
-74.00 dBm	-75.00	-73.00
-79.00 dBm	-80.00	-78.00
-84.00 dBm	-85.00	-83.00
-89.00 dBm	-90.00	-88.00
-94.00 dBm	-95.00	-93.00
-99.00 dBm	-100.00	-98.00
-104.00 dBm	-105.00	-103.00
1900 MHz Carrier		
-14.00 dBm	-15.00	-13.00
-19.00 dBm	-20.00	-18.00
-24.00 dBm	-25.00	-23.00
-29.00 dBm	-30.00	-28.00
-34.00 dBm	-35.00	-33.00
-39.00 dBm	-40.00	-38.00

RF Generator Level Accuracy		
Test Conditions	Minimum	Maximum
-44.00 dBm	-45.00	-43.00
-49.00 dBm	-50.00	-48.00
-54.00 dBm	-55.00	-53.00
-59.00 dBm	-60.00	-58.00
-64.00 dBm	-65.00	-63.00
-69.00 dBm	-70.00	-68.00
-74.00 dBm	-75.00	-73.00
-79.00 dBm	-80.00	-78.00
-84.00 dBm	-85.00	-83.00
-89.00 dBm	-90.00	-88.00
-94.00 dBm	-95.00	-93.00
-99.00 dBm	-100.00	-98.00
-104.00 dBm	-105.00	-103.00

RF Generator Spectral Purity

Overview:

This procedure tests the RF generator for Harmonic, Sub-harmonic and Spurious leakage. RF spectral purity is tested for the following technologies:

- **GSM**
- **TDMA**
- **CDMA2000** 1GHz only

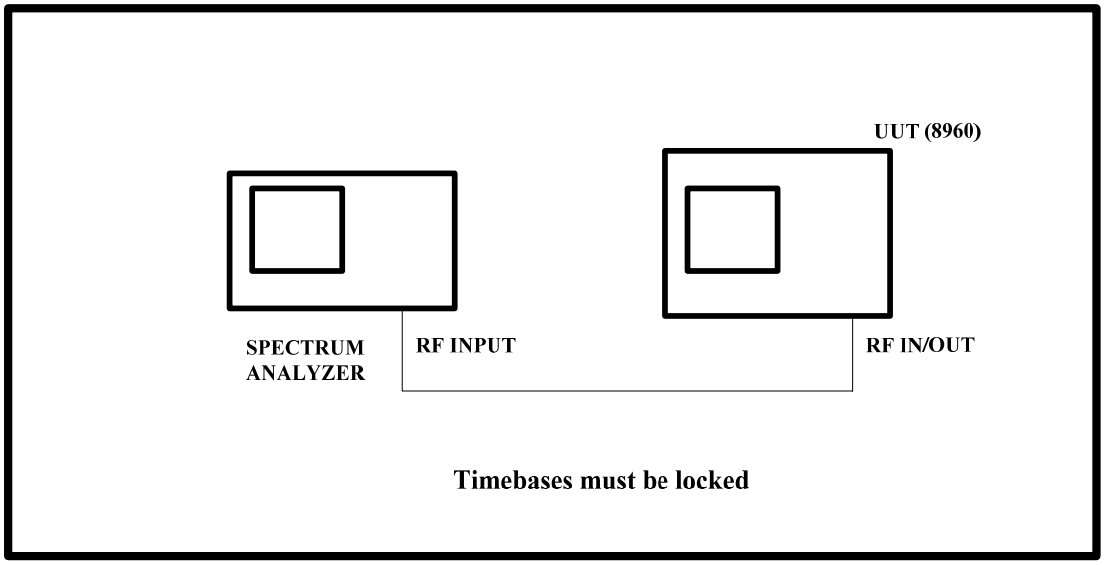
Recommended Test Equipment:

- Agilent PSA Spectrum Analyzer (required frequency range: 400 to 6000 MHz)

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Time-bases must be locked.

Test Methodology:

8960 applies an un-modulated CW signal to the spectrum analyzer. Range the Spec Analyzer appropriate to trigger a level measurement at the frequency of the test as well as at the Harmonics, Sub-harmonics and Spurious of the tests.

RF Generator Spectral Purity Data Points

Test Conditions	Second Harmonic Maximum (dBc)	Third Harmonic Maximum (dBc)	Half Harmonic Maximum (dBc)
Source 1 Harmonics			**Sub Harmonics**
-17 dBm Carrier Level			
810 MHz Carrier	-25.00	-25.00	-40.00
860 MHz Carrier	-25.00	-25.00	-40.00
910 MHz Carrier	-25.00	-25.00	-40.00
960 MHz Carrier	-25.00	-25.00	-40.00
1700 MHz Carrier	-25.00	-25.00	-40.00
1750 MHz Carrier	-25.00	-25.00	-40.00
1800 MHz Carrier	-25.00	-25.00	-40.00
1850 MHz Carrier	-25.00	-25.00	-40.00
1900 MHz Carrier	-25.00	-25.00	-40.00
1950 MHz Carrier	-25.00	-25.00	-40.00
1990 MHz Carrier	-25.00	-25.00	-40.00
-26 dBm Carrier Level			
810 MHz Carrier	-25.00	-25.00	-40.00
860 MHz Carrier	-25.00	-25.00	-40.00
910 MHz Carrier	-25.00	-25.00	-40.00
960 MHz Carrier	-25.00	-25.00	-40.00
1700 MHz Carrier	-25.00	-25.00	-40.00
1750 MHz Carrier	-25.00	-25.00	-40.00
1800 MHz Carrier	-25.00	-25.00	-40.00
1850 MHz Carrier	-25.00	-25.00	-40.00
1900 MHz Carrier	-25.00	-25.00	-40.00
1950 MHz Carrier	-25.00	-25.00	-40.00
1990 MHz Carrier	-25.00	-25.00	-40.00
Source 2 Harmonics			
-17 dBm Carrier Level			
810 MHz Carrier	-25.00	-25.00	-40.00
860 MHz Carrier	-25.00	-25.00	-40.00
910 MHz Carrier	-25.00	-25.00	-40.00
960 MHz Carrier	-25.00	-25.00	-40.00
1700 MHz Carrier	-25.00	-25.00	-40.00
1750 MHz Carrier	-25.00	-25.00	-40.00
1800 MHz Carrier	-25.00	-25.00	-40.00
1850 MHz Carrier	-25.00	-25.00	-40.00
1900 MHz Carrier	-25.00	-25.00	-40.00
1950 MHz Carrier	-25.00	-25.00	-40.00
1990 MHz Carrier	-25.00	-25.00	-40.00
-26 dBm Carrier Level			
810 MHz Carrier	-25.00	-25.00	-40.00
860 MHz Carrier	-25.00	-25.00	-40.00
910 MHz Carrier	-25.00	-25.00	-40.00

960 MHz Carrier	-25.00	-25.00	-40.00
1700 MHz Carrier	-25.00	-25.00	-40.00
1750 MHz Carrier	-25.00	-25.00	-40.00
1800 MHz Carrier	-25.00	-25.00	-40.00
1850 MHz Carrier	-25.00	-25.00	-40.00
1900 MHz Carrier	-25.00	-25.00	-40.00
1950 MHz Carrier	-25.00	-25.00	-40.00
1990 MHz Carrier	-25.00	-25.00	-40.00

Test Conditions	Maximum (dBc)
Source 1 Spurious	
996 MHz Carrier	
-26 dBm Carrier Level	
995.792 MHz	-55.00
996.208 MHz	-55.00
995.884 MHz	-55.00
995.876 MHz	-55.00
996.116 MHz	-55.00
996.124 MHz	-55.00
995.857 MHz	-55.00
995.849 MHz	-55.00
996.143 MHz	-55.00
996.151 MHz	-55.00
991 MHz	-68.00
1001 MHz	-68.00
986 MHz	-68.00
1006 MHz	-68.00
976 MHz	-68.00
1016 MHz	-68.00
1990 MHz Carrier	
-27 dBm Carrier Level	
1989.792 MHz	-55.00
1990.208 MHz	-55.00
1989.884 MHz	-55.00
1989.876 MHz	-55.00
1990.116 MHz	-55.00
1990.124 MHz	-55.00
1989.857 MHz	-55.00
1989.849 MHz	-55.00
1990.143 MHz	-55.00
1990.151 MHz	-55.00
1985 MHz	-68.00
1995 MHz	-68.00
1980 MHz	-68.00
2000 MHz	-68.00
1970 MHz	-68.00
2010 MHz	-68.00
Source 2 Spurious	
996 MHz Carrier	
-26 dBm Carrier Level	
995.792 MHz	-55.00
996.208 MHz	-55.00
995.884 MHz	-55.00
995.876 MHz	-55.00

Test Conditions	Maximum (dBc)
996.116 MHz	-55.00
996.124 MHz	-55.00
995.857 MHz	-55.00
995.849 MHz	-55.00
996.143 MHz	-55.00
996.151 MHz	-55.00
991 MHz	-68.00
1001 MHz	-68.00
986 MHz	-68.00
1006 MHz	-68.00
976 MHz	-68.00
1016 MHz	-68.00
1990 MHz Carrier	
-27 dBm Carrier Level	
1989.792 MHz	-55.00
1990.208 MHz	-55.00
1989.884 MHz	-55.00
1989.876 MHz	-55.00
1990.116 MHz	-55.00
1990.124 MHz	-55.00
1989.857 MHz	-55.00
1989.849 MHz	-55.00
1990.143 MHz	-55.00
1990.151 MHz	-55.00
1985 MHz	-68.00
1995 MHz	-68.00
1980 MHz	-68.00
2000 MHz	-68.00
1970 MHz	-68.00
2010 MHz	-68.00

RF Analyzer Level Accuracy

Overview:

This procedure tests the power level accuracy of the RF analyzer. RF This level accuracy is tested for the following technologies:

- **GSM**
- **TDMA**
- **CDMA2000**

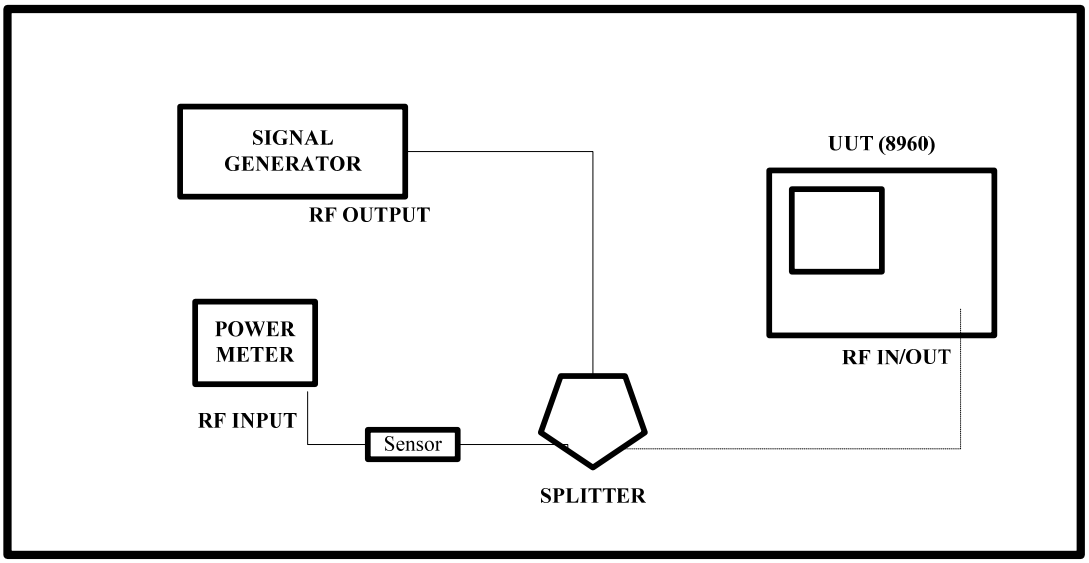
Test Equipment:

- Agilent E-Series Power Meter
- Agilent E4412A Power Sensor
- Agilent 11667A Power Splitter
- Agilent ESG with High Output opt UNB.

Connect ID:

- ESG + SPLITTER + PM CONNECT

Setup:



Note: Connect the power sensor directly to the power splitter; do not use a cable. Connect the power splitter to the test set with a short Type-N adapter. The cable between the power splitter and signal generator is not critical.

Test Methodology:

The signal generator is set to generate a CW signal determined by the data point being measured. The signal is equally split into two paths: one goes to a power meter, the other to the test set. The two readings should be the same; any difference represents a measurement error.

RF Analyzer Level Accuracy Data Points

Test Conditions	Minimum	Maximum
835 MHz Carrier		
-14.00 dBm	-0.27	0. 27
-7.00 dBm	-0.27	0. 27
0.00 dBm	-0.27	0. 27
7.00 dBm	-0.27	0. 27
10.00 dBm	-0.27	0. 27
895 MHz Carrier		
-14.00 dBm	-0.27	0. 27
-7.00 dBm	-0.27	0. 27
0.00 dBm	-0.27	0. 27
7.00 dBm	-0.27	0. 27
10.00 dBm	-0.27	0. 27
For GSM and AMPS/136		
1745MHz Carrier		
-14.00 dBm	-0.29	0. 29
-7.00 dBm	-0.29	0. 29
0.00 dBm	-0.29	0. 29
7.00 dBm	-0.29	0. 29
10.00 dBm	-0.29	0. 29
1880MHz Carrier		
-14.00 dBm	-0.29	0. 29

Test Conditions	Minimum	Maximum
-7.00 dBm	-0.29	0. 29
0.00 dBm	-0.29	0. 29
7.00 dBm	-0.29	0. 29
10.00 dBm	-0.29	0. 29

RF Analyzer FM Accuracy

Overview:

This procedure tests the FM accuracy, FM distortion and residual FM of the RF analyzer. This FM accuracy is tested for the following technologies:

- **TDMA**
- **CDMA2000**

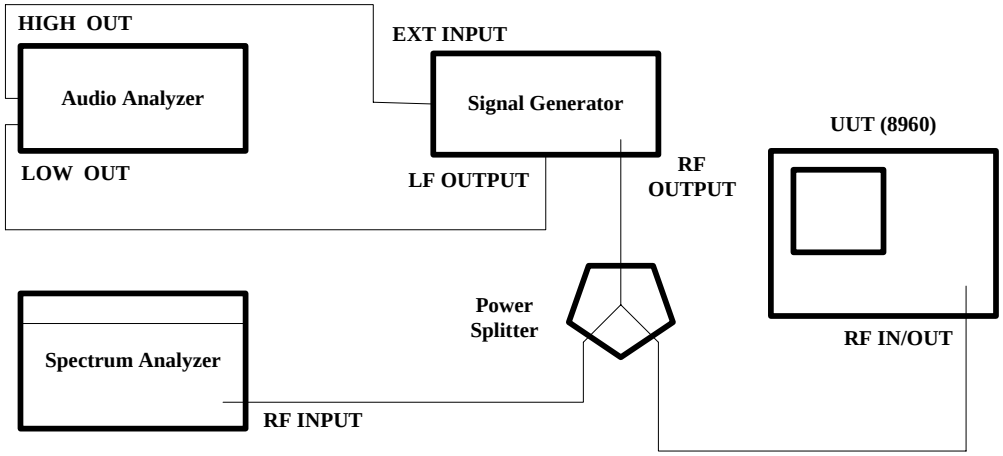
Test Equipment:

- Agilent PSA series Spectrum Analyzer with Measuring Receiver Option
- Agilent 8903B Audio Analyzer
- Agilent ESG Series Signal Generator
- Agilent 11667A Power Splitter

Connect ID:

- PSA RFAN FM CONNECT

Setup:



Test Methodology:

The signal generator is internally modulated for FM Accuracy, externally modulated for FM Distortion and not modulated for Residual FM.
The signal generator (except for residual FM) is externally frequency modulated by the audio analyzer. For most measurements, the FM is demodulated and measured both by the PSA and the test set. The measured results should be read

the same; any difference represents a measurement error. FM distortion and residual FM are measured only by the test set.

RF Analyzer FM Accuracy Data Points

FM Accuracy		
Test Conditions	Minimum (kHz)	Maximum (kHz)
RMS Detector		
850 MHz Carrier		
100 Hz Rate		
5 kHz Deviation		
-15 dBm	4.9	5.1
-10 dBm	4.9	5.1
+10 dBm	4.9	5.1
10 kHz Deviation		
-15 dBm	9.8	10.2
-10 dBm	9.8	10.2
+10 dBm	9.8	10.2
1000 Hz Rate		
5 kHz Deviation		
-15 dBm	4.9	5.1
-10 dBm	4.9	5.1
+10 dBm	4.9	5.1
10 kHz Deviation		
-15 dBm	9.8	10.2
-10 dBm	9.8	10.2
+10 dBm	9.8	10.2
10 kHz Rate		
5 kHz Deviation		
-15 dBm	4.9	5.1
-10 dBm	4.9	5.1
+10 dBm	4.9	5.1
10 kHz Deviation		
-15 dBm	9.8	10.2
-10 dBm	9.8	10.2
+10 dBm	9.8	10.2
960 MHz Carrier		
100 Hz Rate		
5 kHz Deviation		
-15 dBm	4.9	5.1
-10 dBm	4.9	5.1
+10 dBm	4.9	5.1
10 kHz Deviation		
-15 dBm	9.8	10.2
-10 dBm	9.8	10.2
+10 dBm	9.8	10.2
1000 Hz Rate		
5 kHz Deviation		
-15 dBm	4.9	5.1
-10 dBm	4.9	5.1
+10 dBm	4.9	5.1
10 kHz Deviation		
-15 dBm	9.8	10.2
-10 dBm	9.8	10.2
+10 dBm	9.8	10.2

FM Accuracy		
Test Conditions	Minimum (kHz)	Maximum (kHz)
10 kHz Rate		
5 kHz Deviation		
-15 dBm	4.9	5.1
-10 dBm	4.9	5.1
+10 dBm	4.9	5.1
10 kHz Deviation		
-15 dBm	9.8	10.2
-10 dBm	9.8	10.2
+10 dBm	9.8	10.2
Peak+ And Peak- Detectors		
960 MHz Carrier		
5 kHz Deviation		
100 Hz Rate		
-5 dBm PEAK +	4.85	5.15
+10 dBm PEAK +	4.85	5.15
-5 dBm PEAK -	4.85	5.15
+10 dBm PEAK -	4.85	5.15
10 kHz Rate		
-5 dBm PEAK +	4.85	5.15
+10 dBm PEAK +	4.85	5.15
-5 dBm PEAK -	4.85	5.15
+10 dBm PEAK -	4.85	5.15
10 kHz Deviation		
100 Hz Rate		
-5 dBm PEAK +	9.70	10.30
+10 dBm PEAK +	9.70	10.30
-5 dBm PEAK -	9.70	10.30
+10 dBm PEAK -	9.70	10.30
10 kHz Rate		
-5 dBm PEAK +	9.70	10.30
+10 dBm PEAK +	9.70	10.30
-5 dBm PEAK -	9.70	10.30
+10 dBm PEAK -	9.70	10.30

FM Distortion		
Test Conditions	Minimum (%)	Maximum (%)
850 MHz Carrier		
5 kHz Deviation	-12	12
10 kHz Deviation	-12	12
960 MHz Carrier		
5 kHz Deviation	-12	12
10 kHz Deviation	-12	12

FM Dist setup: 8903B = 2Vpk / 1 kHz ESG LF Gen: 300 mVpk / 2 kHz

Residual FM	
Test Conditions	Maximum
C-message Bandwidth	

850 MHz Carrier	
-15 dBm	7.0
-10 dBm	7.0
+10 dBm	7.0
960 MHz Carrier	
-15 dBm	7.0
-10 dBm	7.0
+10 dBm	7.0
100 Hz Bandwidth	
850 MHz Carrier	
-15 dBm	1.5
-10 dBm	1.5
+10 dBm	1.5
960 MHz Carrier	
-15 dBm	1.5
-10 dBm	1.5
+10 dBm	1.5

AF Generator Residual Distortion

Overview:

This procedure tests the residual distortion of the audio generator. This distortion is tested for the following technologies:

- **GSM**
- **TDMA**
- **CDMA2000**

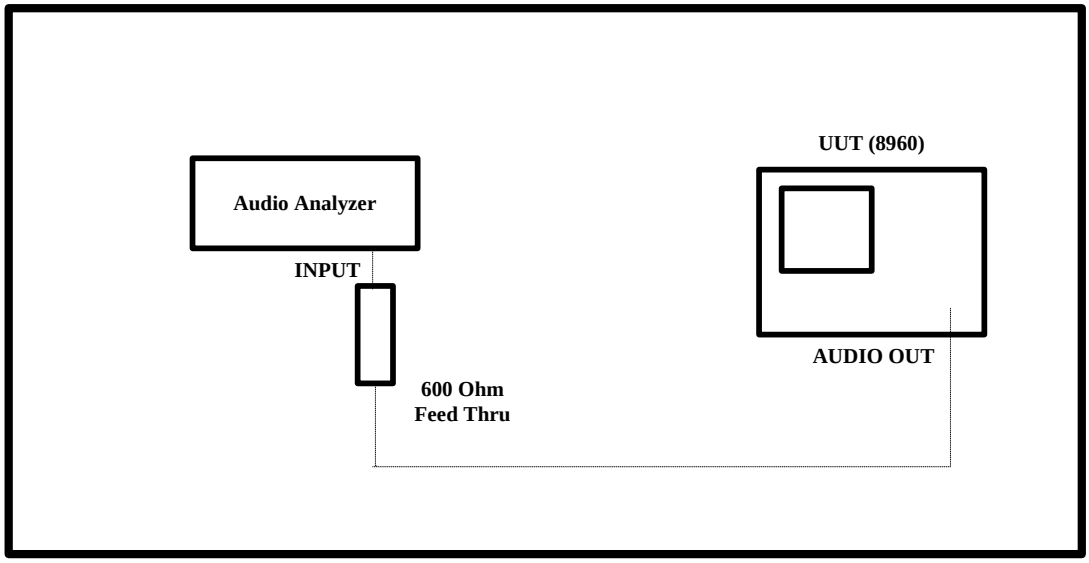
Recommended Test Equipment:

- Agilent 8903B Audio Analyzer
- Agilent 11095A 600 Ohm Feed-thru

Connect ID:

- AUDIO ANA CONNECT

Setup:



Test Methodology:

Set the Audio Analyzer to test the audio signal from the 8960 determined by the data point being measured. Run the source distortion measurement for each data point.

AF Generator Residual Distortion Data Points

Test Conditions	Maximum
5 kHz Audio	
6 V level	0.100
2 V level	0.100
600 mV level	0.100
200 mV level	0.100
1 kHz Audio	
6 V level	0.100
2 V level	0.100
600 mV level	0.100
200 mV level	0.100
500 Hz Audio	
6 V level	0.100
2 V level	0.100
600 mV level	0.100
200 mV level	0.100
100 Hz Audio	
6 V level	0.100
2 V level	0.100
600 mV level	0.100
200 mV level	0.100

AF Generator Level Accuracy

Overview:

This procedure tests the level accuracy of the audio generator. This level accuracy is tested for the following technologies:

- **GSM**
- **TDMA**
- **CDMA2000**

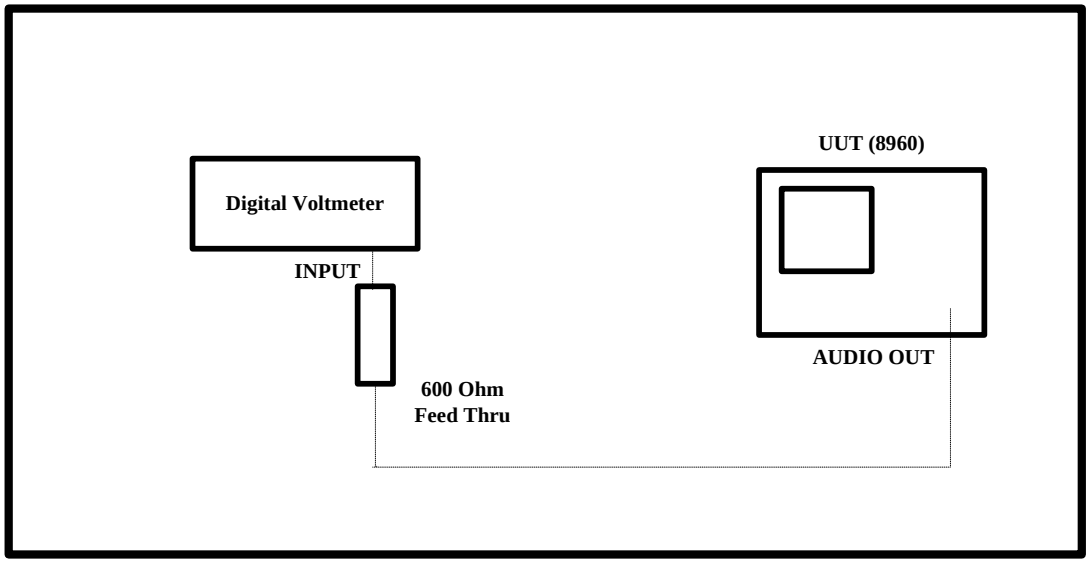
Recommended Test Equipment:

- Agilent 3458A or 34401A Digital Voltmeter
- Agilent 11095A 600 Ohm Feed-thru

Connect ID:

- DMM CONNECT

Setup:



Test Methodology:

The 8960's audio signal is directly measured by the digital voltmeter determined by the data point being measured.

AF Generator Level Accuracy Data Points

Test Conditions	Minimum	Maximum
5 kHz Audio		
6 V level	5.905	6.095
2 V level	1.965	2.035
600 mV level	590.5	609.5
100 mV level	98.00	102.0
1 kHz Audio		
6 V level	5.905	6.095
2 V level	1.965	2.035
600 mV level	590.5	609.5
100 mV level	98.00	102.0

500 Hz Audio		
6 V level	5.905	6.095
2 V level	1.965	2.035
600 mV level	590.5	609.5
100 mV level	98.00	102.0
100 Hz Audio		
6 V level	5.905	6.095
2 V level	1.965	2.035
600 mV level	590.5	609.5
100 mV level	98.00	102.0

AF Analyzer Level Accuracy

Overview:

This procedure tests the level accuracy of the audio analyzer. This level accuracy is tested for the following technologies:

- **GSM**
- **TDMA**
- **CDMA2000**

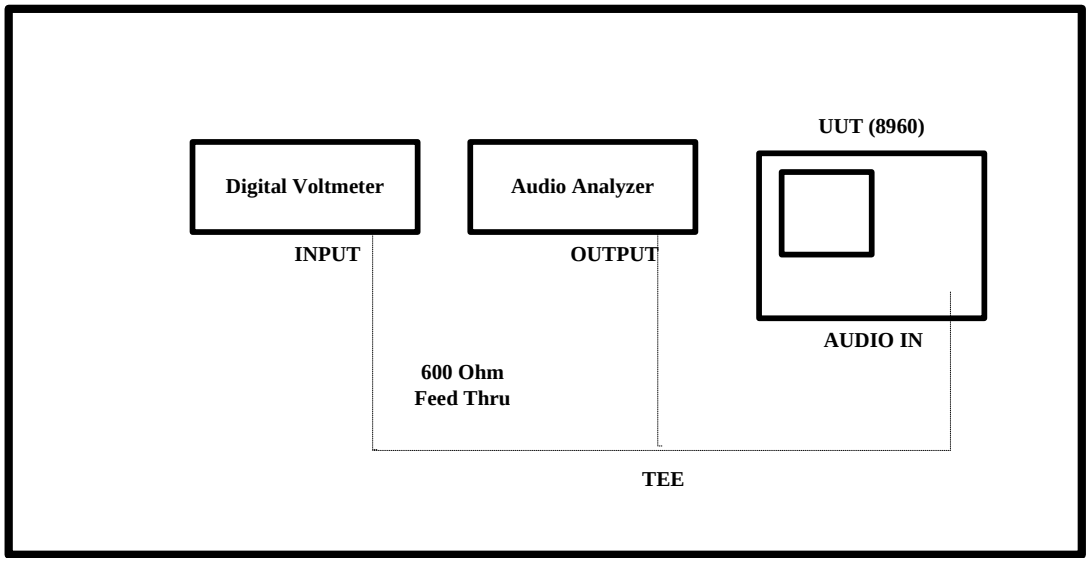
Recommended Test Equipment:

- Agilent 3458A or 34401A Digital Voltmeter
- Agilent 8903B Audio Analyzer

Connect ID:

- AF AN LEVEL CONNECT

Setup:



Test Methodology:

The level of the audio signal generated by the audio analyzer is measured by both the digital voltmeter and the 8960 determined by the data point being measured. For all measurements, the two readings should be the same; any difference represents a measurement error.

AF Analyzer Level Accuracy Data Points

Test Conditions	Minimum	Maximum
5000 mV level		
10 kHz Frequency	4885	5115
5 kHz Frequency	4885	5115
1 kHz Frequency	4885	5115
500 Hz Frequency	4885	5115
200 Hz Frequency	4885	5115
500 mV level		
10 kHz Frequency	488.5	511.5
5 kHz Frequency	488.5	511.5
1 kHz Frequency	488.5	511.5
500 Hz Frequency	488.5	511.5
200 Hz Frequency	488.5	511.5
50 mV level		
10 kHz Frequency	48.80	51.20
5 kHz Frequency	48.80	51.20
1 kHz Frequency	48.80	51.20
500 Hz Frequency	48.80	51.20
200 Hz Frequency	48.80	51.20

AF Analyzer Distortion and SINAD

Overview:

This procedure tests the audio analyzer's ability to measure audio distortion and SINAD. This distortion and SINAD accuracy is tested for the following technologies:

- **TDMA**
- **CDMA2000**

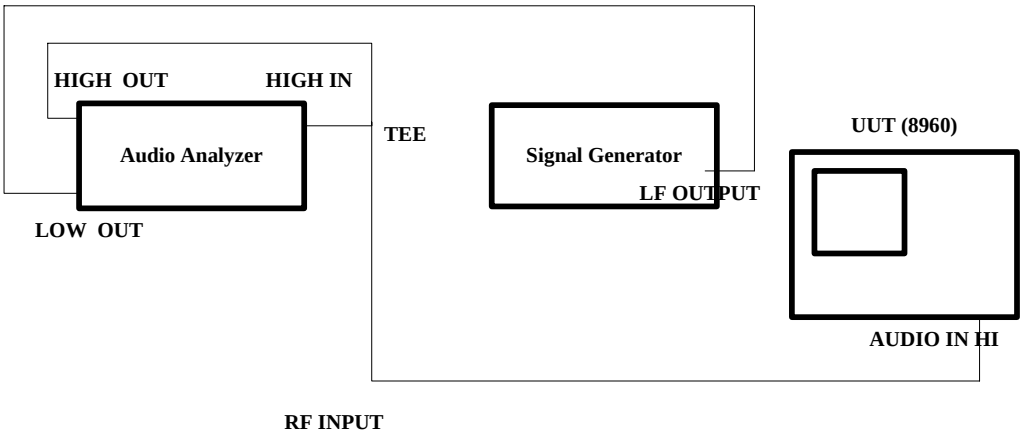
Recommended Test Equipment:

- Agilent ESG Signal Generator
- Agilent 8903B Audio Analyzer

Connect ID:

- AUDIO ANA + ESG CONNECT

Setup:



Test Methodology:

Distortion is simulated by Signal Generator's LF Output and Audio Analyzer's Output and measured by the 8960 and Audio Anlyzer. The equivalent SINAD is also measured. Audio Analyzer output is set at 1 kHz at 1V for all tests and Signal Generator' LF Output is changed from 2 kHz to 3 kHz and 0.1V to 0.05V in accordance to the data points.

AF Analyzer Distortion and SINAD Data Points

Test Conditions	Minimum	Maximum
Distortion Accuracy		
2 kHz Frequency, 0.1 V	8.756	11.144
3 kHz Frequency, 0.1 V	8.756	11.144
2 kHz Frequency, 0.05 V	4.395	5.593
3 kHz Frequency, 0.05 V	4.395	5.593
SINAD Accuracy		
5 kHz Frequency, 0.1 V	19.043	21.043
1 kHz Frequency, 0.1 V	19.043	21.043
500 Hz Frequency, 0.05 V	25.031	27.031
200 Hz Frequency, 0.05 V	25.031	27.031

TDMA Generator Modulation Performance

Overview:

This procedure tests the ability of the I/Q modulator in the RF generator to accurately generate a TDMA modulated signal. This TDMA modulator performance is tested for the **TDMA** applications**.**

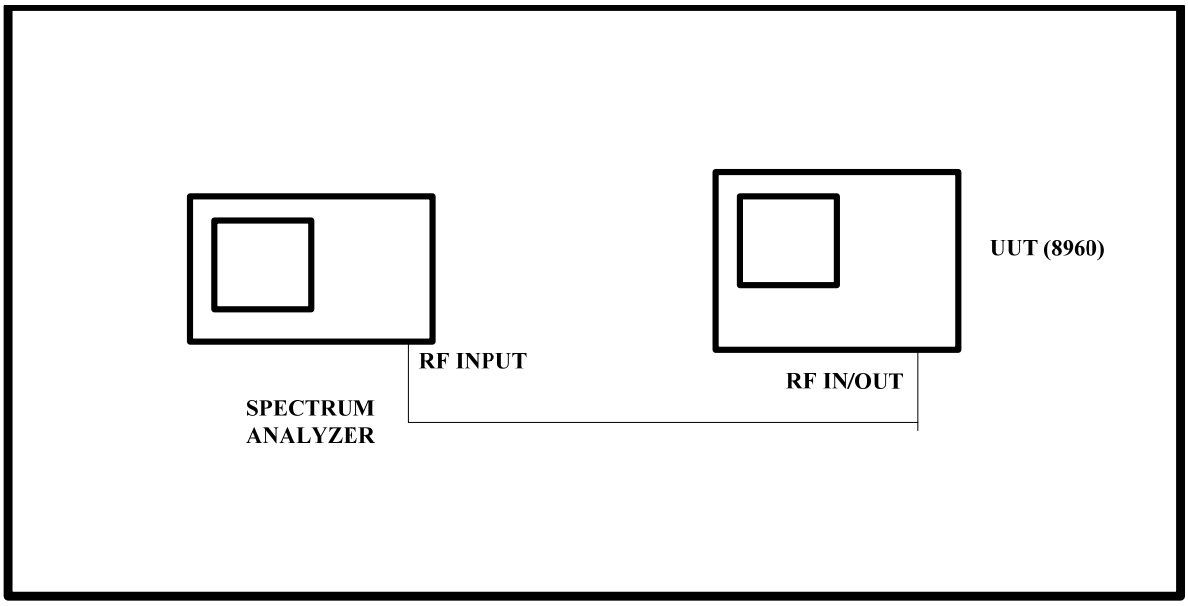
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with TDMA option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time base output of the 8960 to the test equipment

Test Methodology:

The purpose of this test is to verify that the IQ Modulation Process of the 8960 is operating to specification and that no extraneous signals are present on the 8960's source within the CELL and PCS bands, determined by the data point being measured, by measuring Magnitude error, Frequency Error, Phase Error and IQ Origin Offset. Set the PSA to receive a NADC signal at the specified frequency.

CELL channel 1 = frequency 870.03 MHz; channel 790 = frequency 893.70 MHz
PCS channel 2 = frequency 1930.08 MHz; channel 1667 = frequency 1980.03 MHz

TDMA Generator Modulation Performance Data Points

Test Conditions	Minimum	Maximum
Cell Band Channel 1		
EVM		3
Magnitude Error		2.1
Frequency Error	-4	4
Phase Error		1.2
IQ Origin Offset		-35
Cell Band Channel 790		
EVM		3
Magnitude Error		2.1
Frequency Error	-4	4
Phase Error		1.2
IQ Origin Offset		-35
PCS Band Channel 2		
EVM		3

Magnitude Error		2.1
Frequency Error	-4	4
Phase Error		1.2
IQ Origin Offset		-35
PCS Band Channel 1667		
EVM		3
Magnitude Error		2.1
Frequency Error	-4	4
Phase Error		1.2
IQ Origin Offset		-35

TDMA Analyzer Modulation Performance

Overview:

This procedure tests the ability of the RF analyzer to accurately measure the modulation of a TDMA modulated signal. This TDMA analyzer performance is tested for the **TDMA** applications**.**

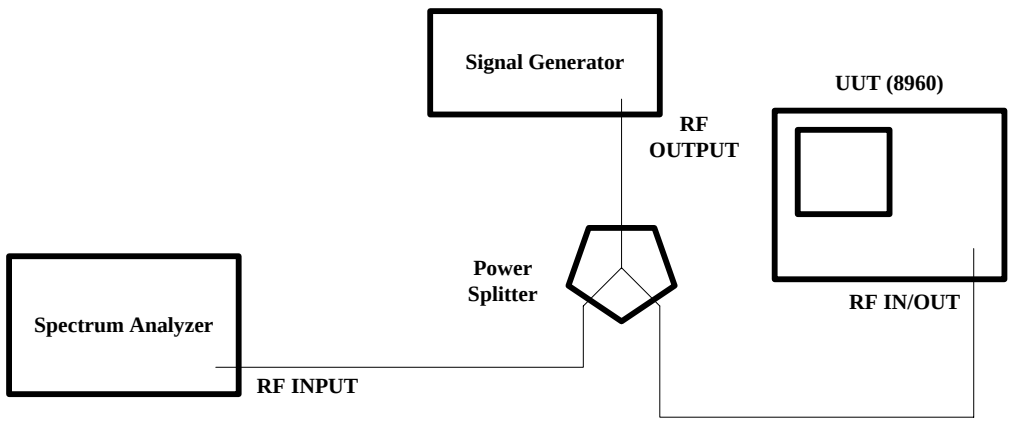
Test Equipment:

- Agilent PSA series Spectrum Analyzer with TDMA Option
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator with TDMA Option

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time base together

Test Methodology:

The signal from the signal generator is split into two paths: one goes to the spectrum analyzer, the another to the 8960. The same measurements are made on both instruments. For all measurements, the two readings should be the same; any difference represents a measurement error. The purpose of this test is to verify that the IQ De-Modulation Process of the 8960 is operating to specification within the CELL and PCS bands by measuring Magnitude error, Frequency Error, Phase Error and IQ Origin Offset.

TDMA Analyzer Modulation Performance Data Points

Test Conditions	Minimum	Maximum
900 MHz		
EVM	-1	1
Magnitude Error	-7	7
Frequency Error	-10	10
Phase Error	-4	4
IQ Origin Offset	-5	5
1900 MHz		
EVM	-1	1
Magnitude Error	-7	7
Frequency Error	-10	10
Phase Error	-4	4
IQ Origin Offset	-5	5

TDMA Analyzer Residual Modulation

Overview:

This procedure tests the residual modulation of the TDMA analyzer. This TDMA analyzer performance is tested for the **TDMA** applications**.**

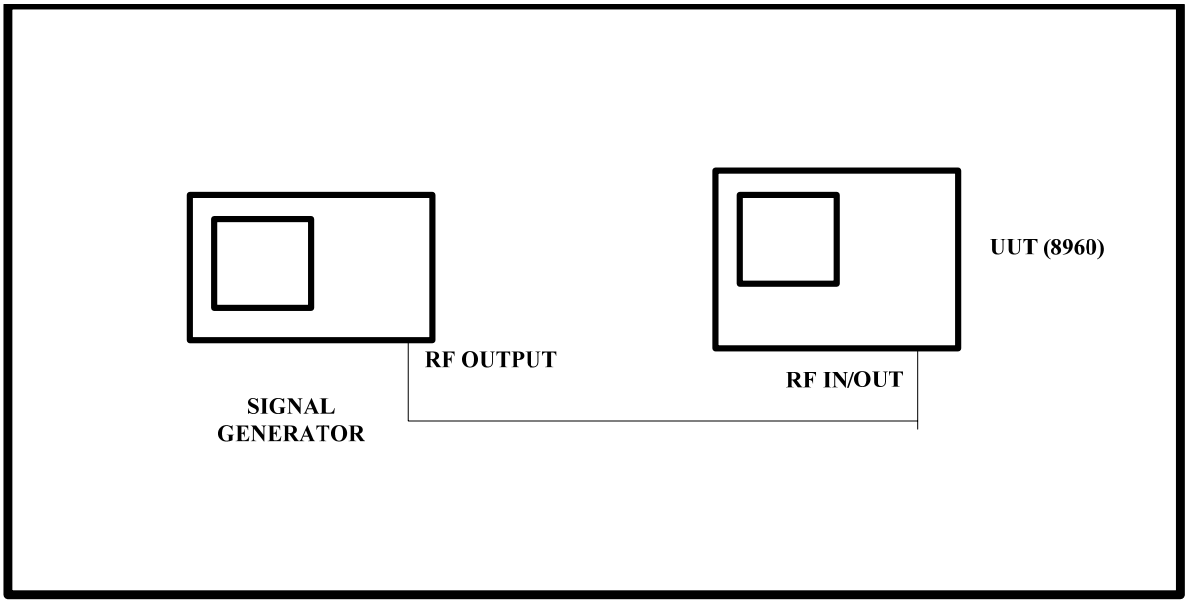
Test Equipment:

- Agilent ESG Series Signal Generator

Connect ID:

- ESG CONNECT

Setup:



Note: Connect the time-bases together

Test Methodology:

The purpose of this test is to determine the Residual EVM and other parameters in the 8960s analyzer over various level conditions. Set up the signal generator the produce a NADC un-bursted signal with SLOT1 type UCUS.

TDMA Analyzer Residual Modulation Data Points

Test Conditions	Maximum
900 MHz	
Residual EVM	1
Residual Magnitude Error	0.7
Residual Phase Error	0.4
Residual Origin Offset	-50
1900 MHz	
Residual EVM	1
Residual Magnitude Error	0.7
Residual Phase Error	0.4
Residual Origin Offset	-50

TDMA Analyzer IQ Tuning

Overview:

This procedure tests the ability of the TDMA analyzer to measure distortion on a TDMA modulated signal. This TDMA analyzer performance is tested on the **TDMA** applications**.**

Test Equipment:

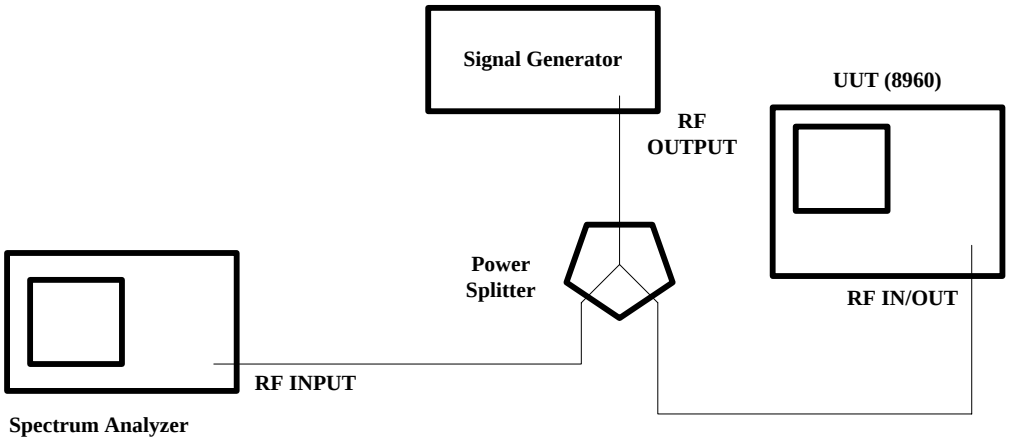
- Agilent PSA series Spectrum Analyzer

- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator with TDMA Option

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time-bases together

Test Methodology:

An arbitrary waveform signal generated by the signal generator is split into two paths: one goes to the spectrum analyzer input, the other to the test set. The source generates a carrier and a spur which is checked with the spectrum analyzer and compared against the test set reading. For all measurements, the two readings should be the same; any difference represents a measurement error. The offset frequencies checked are ±3.0375, ±6.0375, ±9.1125, and ±12.15 kHz.

TDMA Analyzer IQ Tuning Data Points

Test Conditions	Minimum	Maximum
856 MHz		
Offset +3.0375 kHz	-1	1
Offset -3.0375 kHz	-1	1
Offset +6.0375 kHz	-1	1
Offset -6.0375 kHz	-1	1
Offset +9.1125 kHz	-1	1
Offset -9.1125 kHz	-1	1
Offset +12.15 kHz	-1	1
Offset -12.15 kHz	-1	1
2000 MHz		
Offset +3.0375 kHz	-1	1
Offset -3.0375 kHz	-1	1
Offset +6.0375 kHz	-1	1

Offset -6.0375 kHz	-1	1
Offset +9.1125 kHz	-1	1
Offset -9.1125 kHz	-1	1
Offset +12.15 kHz	-1	1
Offset -12.15 kHz	-1	1

TDMA Analyzer Adjacent Channel Power Accuracy

Overview:

This procedure tests the ability of the TDMA analyzer to accurately measure power in the adjacent channels. This TDMA analyzer performance is tested for the **TDMA** applications**.**

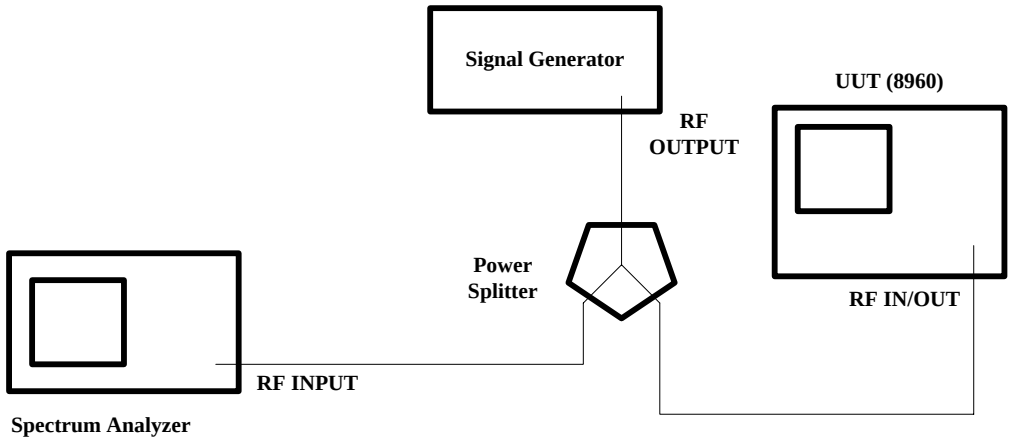
Test Equipment:

- Agilent PSA series Spectrum Analyzer
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator with TDMA Option

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time-bases together

Test Methodology:

An arbitrary waveform signal generated by the signal generator is split into two paths: one goes to the spectrum analyzer input, the other to the test set. The source generates a carrier and spurs, representing an upper or lower adjacent or first or second alternate channel spurs, This arbitrary wave for has a know

frequency and power offsets, any difference between the know values and the UUT represents a measurement error.

TDMA Analyzer Adjacent Channel Power Accuracy Data Points

Test Conditions	Minimum	Maximum
900 MHz		
Lower Adjacent Channel	-1.2	1.2
Upper Adjacent Channel	-1.2	1.2
Lower 1st Alternate	-1.2	1.2
Upper 1st Alternate	-1.2	1.2
Lower 2nd Alternate	-1.2	1.2
Upper 2nd Alternate	-1.2	1.2
1900 MHz		
Lower Adjacent Channel	-1.2	1.2
Upper Adjacent Channel	-1.2	1.2
Lower 1st Alternate	-1.2	1.2
Upper 1st Alternate	-1.2	1.2
Lower 2nd Alternate	-1.2	1.2
Upper 2nd Alternate	-1.2	1.2

See technical specifications for adjacent channel frequencies.

GSM Generator Modulation Performance

Overview:

This procedure tests the ability of the I/Q modulator in the RF generator to accurately generate a GSM modulated signal. This RF generator performance is tested for the **GSM** applications**.**

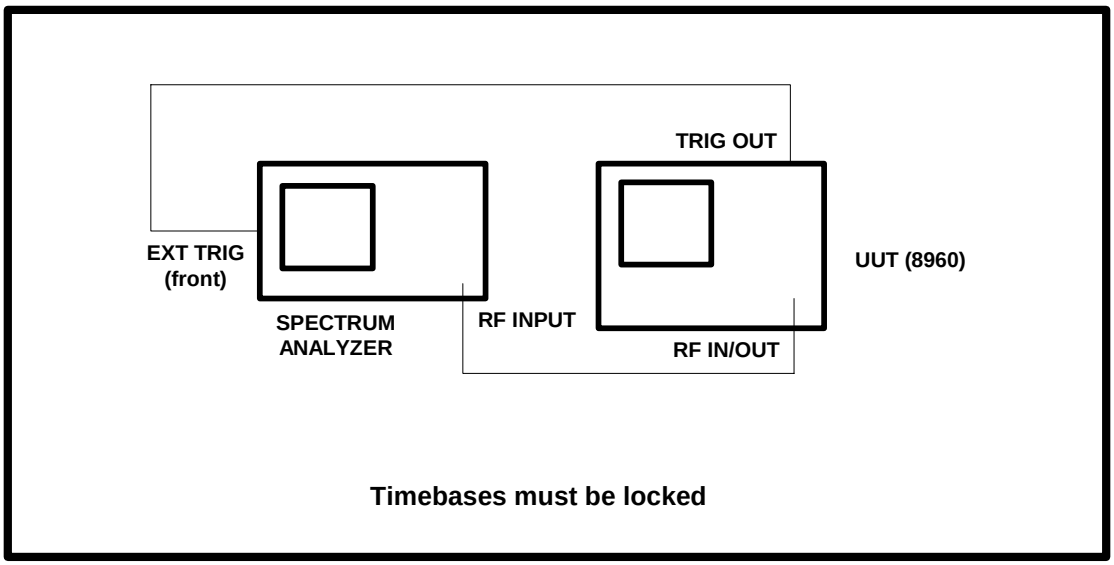
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with GSM/EDGE option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: The time-bases MUST be locked

Test Methodology:

The purpose of this test is to verify that the IQ Modulation Process of the 8960 is operating to specification and that no extraneous signals are present on the 8960's source within the CELL and PCS bands by measuring Peak Phase Error, RMS Phase Error, Amplitude Maximum and Amplitude Minimum.

GSM Generator Modulation Performance Data Points

Test Conditions	Minimum	Maximum
Source 1		
940 MHz		
Peak Phase Error	-4.00	4.00
RMS Phase Error	-1.00	1.00
Amplitude Maximum		0.30
Amplitude Minimum	-0.30	
1840 MHz		
Peak Phase Error	-4.00	4.00
RMS Phase Error	-1.00	1.00
Amplitude Maximum		0.30
Amplitude Minimum	-0.30	
Source 2		
940 MHz		
Peak Phase Error	-4.00	4.00
RMS Phase Error	-1.00	1.00
Amplitude Maximum		0.30
Amplitude Minimum	-0.30	
1840 MHz		
Peak Phase Error	-4.00	4.00
RMS Phase Error	-1.00	1.00
Amplitude Maximum		0.30
Amplitude Minimum	-0.30	

GSM Analyzer Modulation Performance

Overview:

This procedure tests the ability of the RF analyzer to accurately measure the modulation of a GSM modulated signal. This GSM analyzer performance is tested for the **GSM** applications**.**

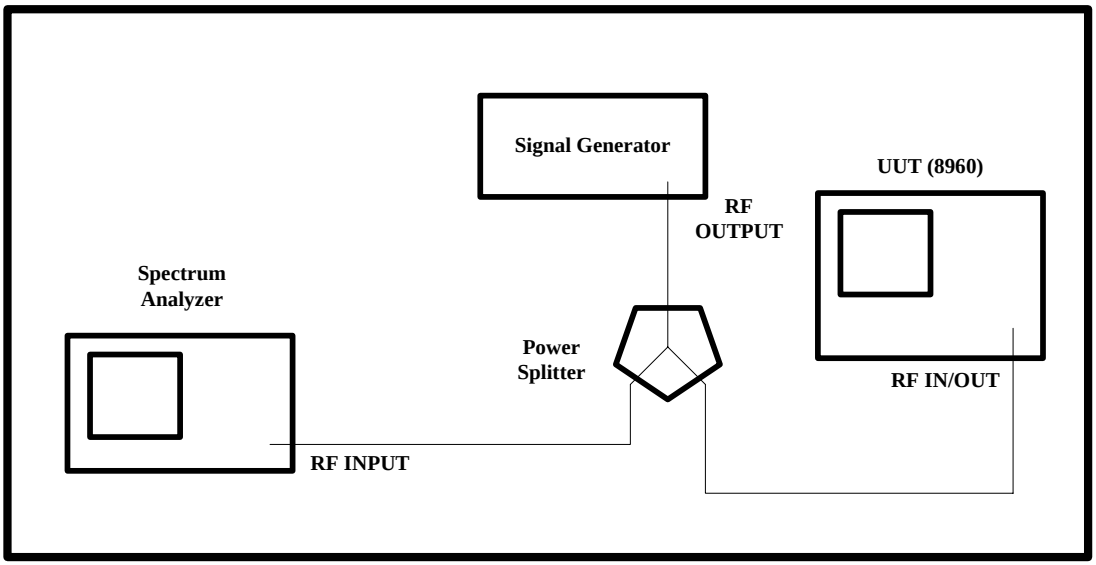
Test Equipment:

- Agilent PSA Series Spectrum Analyzer with GSM Option
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator with TDMA Option

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time-bases together

Test Methodology:

The signal from the signal generator is split into two paths: one goes to the spectrum analyzer the other to the test set. The same measurements are made on both instruments. For all measurements, the two readings should be the same; any difference represents a measurement error. The purpose of this test is to verify that the IQ De-Modulation Process of the 8960 is operating to specification within the CELL and PCS bands by measuring Peak Phase Error, RMS Phase Error, and Frequency Error.

GSM Analyzer Modulation Performance Data Points

Test Conditions	Minimum	Maximum
835 MHz		
Peak Phase Error	-4.00	4.00
RMS Phase Error	-1.00	1.00
Frequency Error	-12.00	12.00
895 MHz		
Peak Phase Error	-4.00	4.00
RMS Phase Error	-1.00	1.00
Frequency Error	-12.00	12.00
1745 MHz		
Peak Phase Error	-4.00	4.00
RMS Phase Error	-1.00	1.00
Frequency Error	-12.00	12.00
1880 MHz		
Peak Phase Error	-4.00	4.00
RMS Phase Error	-1.00	1.00
Frequency Error	-12.00	12.00

GSM Analyzer IQ Tuning

Overview:

This procedure tests the ability of the GSM analyzer to measure distortion on a GSM modulated signal. This TDMA analyzer performance is tested on the **GSM** applications**.**

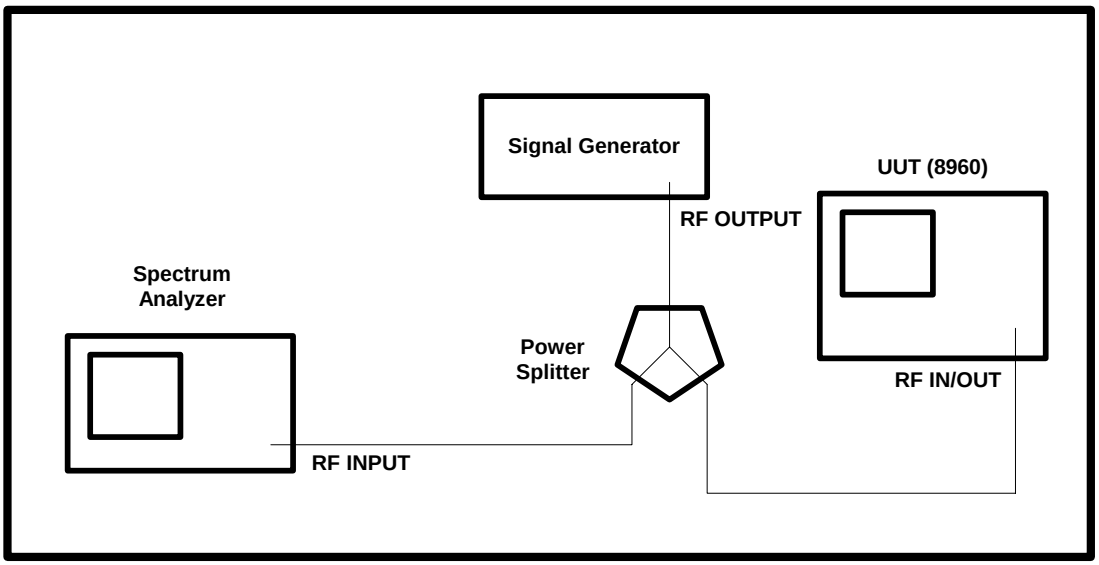
Test Equipment:

- Agilent PSA series Spectrum Analyzer.
- Agilent ESG series Signal Generator with ARB waveform generator.
- Agilent 11667A Power Splitter.

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time bases together.

Test Methodology:

A multi tone signal is created on the ESG to emulate the carrier and spurs, representing an upper or lower adjacent or first or second alternate channel spurs. The multi tone signal has a known frequency and power offsets, measured by the PSA. Any difference between the known values and the UUT represents a measurement error. The offset frequencies checked are ±67.7, ±135.4, ±203.1, and ±270.8 kHz.

GSM Analyzer IQ Tuning Data Points

Test Conditions	Minimum	Maximum
824.3 MHz		
Offset +270.8 kHz	-1	1
Offset -270.8 kHz	-1	1
Offset +203.1 kHz	-1	1
Offset –203.1 kHz	-1	1
Offset +135.4 kHz	-1	1
Offset –135.4 kHz	-1	1
Offset +67.7 kHz	-1	1
Offset –67.7 kHz	-1	1
1949.3 MHz		
Offset +270.8 kHz	-1	1
Offset -270.8 kHz	-1	1
Offset +203.1 kHz	-1	1
Offset –203.1 kHz	-1	1
Offset +135.4 kHz	-1	1
Offset –135.4 kHz	-1	1
Offset +67.7 kHz	-1	1
Offset –67.7 kHz	-1	1

GSM Output RF Spectrum (ORFS) Accuracy

Overview:

This procedure tests the ability of the RF analyzer to accurately measure the Output RF Spectrum of a GSM modulated signal. This GSM analyzer performance is tested for the **GSM** applications**.**

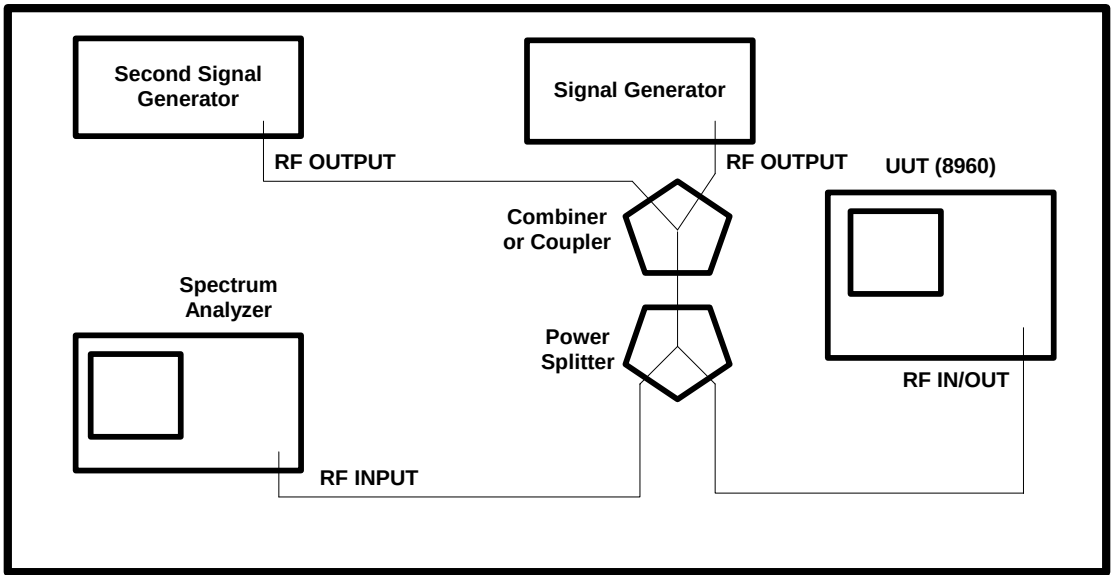
Test Equipment:

- Agilent PSA series Spectrum Analyzer
- Agilent 11667A Power Splitter
- Agilent 11636A/B Power Combiner or Agilent 86205A Coupler
- Agilent E443XB Signal Generator – (E4432B/33B/36B/37B)
- Agilent ESG Signal Generator

Connect ID:

- PSA + ESG + ESG + COMBINER CONNECT or
- PSA + ESG + ESG + COUPLER CONNECT

Setup:



Note: Connect the time bases together.

Test Methodology:

The signals from two sources are combined then split into two paths: one goes to the spectrum analyzer input, the other to the 8960. One source generates a carrier and the other a spur, representing a spur due to modulation, which is checked with the spectrum analyzer and compared against the 8960 reading. For all measurements, the two readings should be the same; any difference represents a measurement error.

GSM Output RF Spectrum (ORFS) Accuracy Data Points

Test Conditions	Minimum	Maximum
900 MHz		
Offset +100 kHz	-1.5	1.5
Offset –100 kHz	-1.5	1.5
Offset +200 kHz	-1.5	1.5
Offset –200 kHz	-1.5	1.5
Offset +250 kHz	-1.5	1.5
Offset –250 kHz	-1.5	1.5
Offset +400 kHz	-1.5	1.5
Offset –400 kHz	-1.5	1.5
1800 MHz		
Offset +100 kHz	-1.5	1.5
Offset –100 kHz	-1.5	1.5
Offset +200 kHz	-1.5	1.5
Offset –200 kHz	-1.5	1.5
Offset +250 kHz	-1.5	1.5
Offset –250 kHz	-1.5	1.5
Offset +400 kHz	-1.5	1.5
Offset –400 kHz	-1.5	1.5

See technical specifications for adjacent channel frequencies.

C2K Generator Modulation Performance

Overview:

This procedure tests the ability of the I/Q modulator in the RF generator to accurately generate a CDMA2000 modulated signal. This RF generator performance is tested for the **CDMA2000** applications**.**

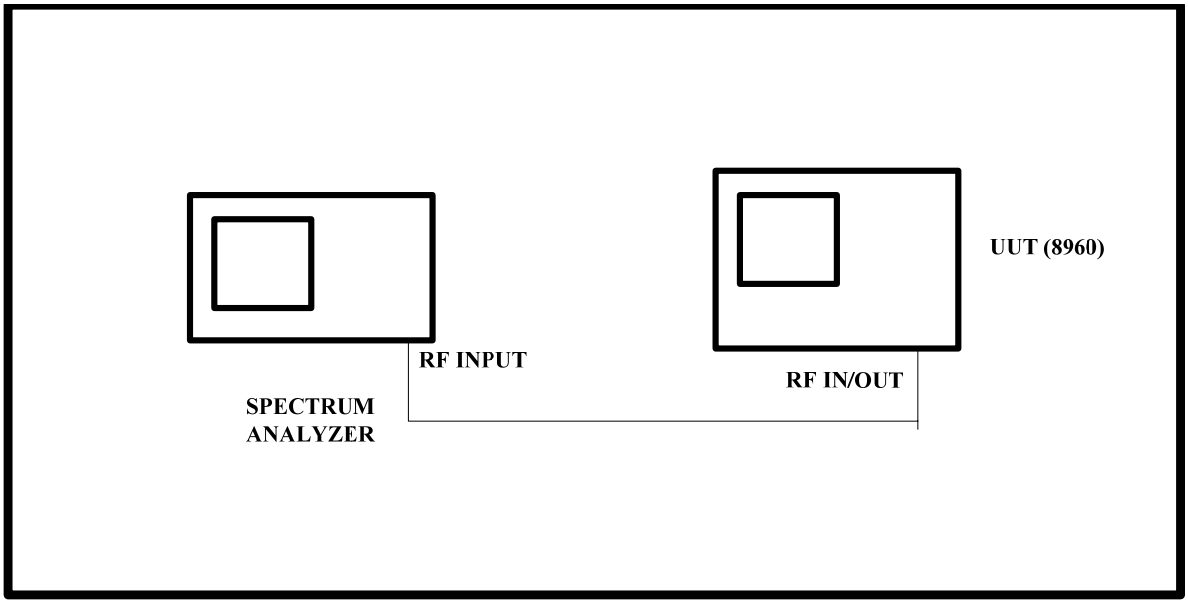
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with CDMA Option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together. Connect the rear TRIG OUT of 8960 to the front EXT TRIGGER INPUT of PSA.

Test Methodology:

The purpose of this test is to verify that the IQ Modulation Process of the 8960 is operating to specification. This test verifies that most of the baseband modulation process is working and that the RF output does not excessively distort the signal.

C2K Generator Modulation Performance Data Points

Test Conditions	Minimum	Maximum
800 MHz		
RHO	0.98	
EVM		10
1000 MHz		
RHO	0.98	
EVM		10
1850 MHz		
RHO	0.98	
EVM		10
2150 MHz		
RHO	0.98	
EVM		10

C2K Analyzer Modulation Accuracy

Overview:

This procedure tests the ability of the RF analyzer to accurately measure the modulation of a CDMA2000 modulated signal. This CDMA2000 analyzer performance is tested for the **CDMA2000** applications**.**

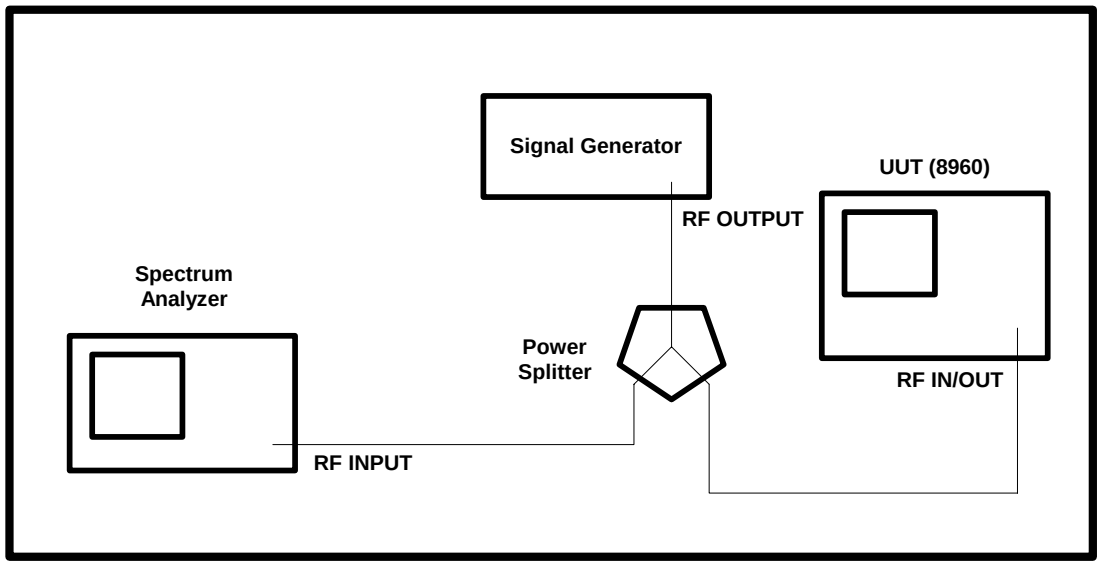
Test Equipment:

- Agilent PSA series Spectrum Analyzer with CDMA option
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator with CDMA option

Connect ID:

- PSA +ESG CONNECT

Setup:



Note: Connect the time-bases together. For C2K, Connect the signal generator EVENT1 to the 8960's TRIGGER INPUT and PSA's rear TRIGGER IN.

Test Methodology:

The signal from the signal generator is split into two paths: one goes to the spectrum analyzer the other to the 8960. The same measurements are made on both instruments. For all measurements, the two readings should be the same; any difference represents a measurement error. The test is to determine the analyzer's ability to measure EVM and other parameters over various level conditions determined by the data point.

C2K Analyzer Modulation Accuracy Data Points

Test Conditions	Minimum	Maximum
900 MHz		

-4 dBm		
RHO Accuracy	-0.003	+0.003
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
-16 dBm		
RHO Accuracy	-0.003	+0.003
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
-25 dBm		
RHO Accuracy	-0.003	+0.003
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
1900 MHz		
-4 dBm		
RHO Accuracy	-0.003	+0.003
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
-16 dBm		
RHO Accuracy	-0.003	+0.003
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
-25 dBm		
RHO Accuracy	-0.003	+0.003
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15

C2K / 1xEV-DO Generator Digital Power Accuracy

Overview:

This procedure tests the relative output level accuracy of the RF generator with modulation and the AWGN source turned on. The C2K/1xEV-DO GEN DIG PWR performance is tested on the **CDMA2000 or 1xEV-DO** applications.

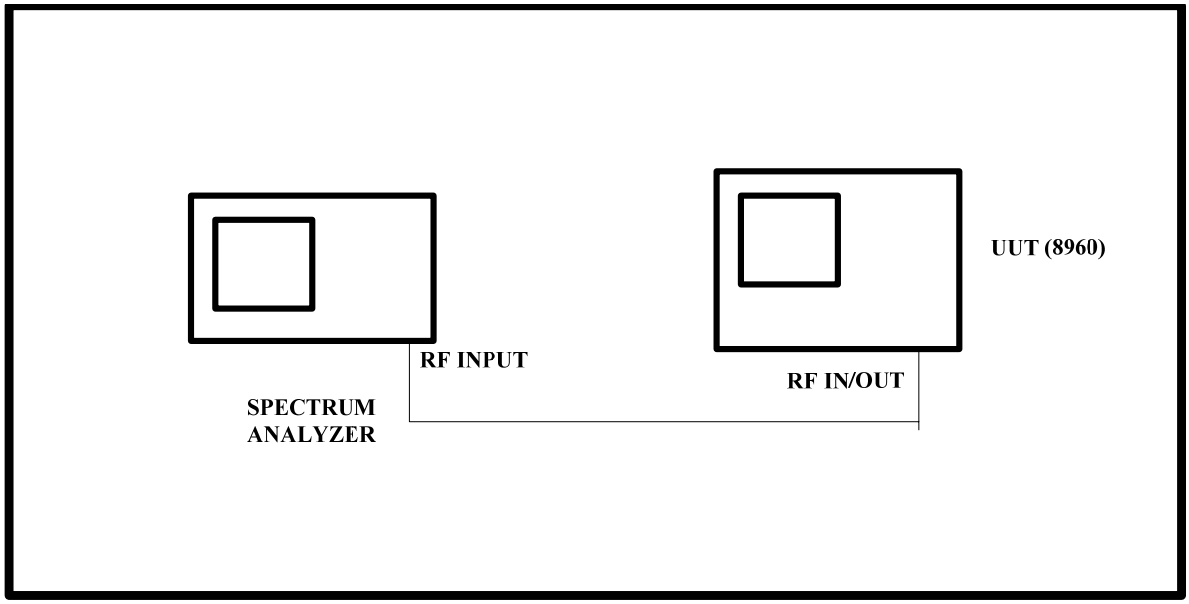
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with CDMA option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together. Connect the rear TRIG OUT of 8960 to the front EXT TRIGGER INPUT of PSA.

Test Methodology:

The purpose for this test is to verify output level accuracy with modulation and the AWGN source turned on relative to CW signal. For each test point, set 8960 outputs a CW signal and modulated signal one by one at the specified frequency and level specified in the data points. Measure CW and CDMA2000 signal both, then compare in accordance with:(8960_cw-8960_cdma)-(PSA_cw-PSA_cdma).

C2K / 1xEV-DO Generator Digital Power Accuracy Data Points

Test Conditions	Minimum	Maximum
870 MHz		
AWGN Off		
-16.94 dBm	-1.10	+1.10
-21.94 dBm	-1.10	+1.10
-26.94 dBm	-1.10	+1.10
AWGN On		
-16.94 dBm	-1.20	+1.20
-21.94 dBm	-1.20	+1.20
-26.94 dBm	-1.20	+1.20
1930 MHz		
AWGN Off		
-18.61 dBm	-1.10	+1.10
-23.61 dBm	-1.10	+1.10
-28.61 dBm	-1.10	+1.10
AWGN On		
-18.61 dBm	-1.20	+1.20
-23.61 dBm	-1.20	+1.20
-28.61 dBm	-1.20	+1.20

C2K Analyzer Average Power Accuracy

Overview:

This procedure tests the accuracy of the average power detector in the RF analyzer. This RF analyzer performance is tested for the **CDMA2000** applications**.**

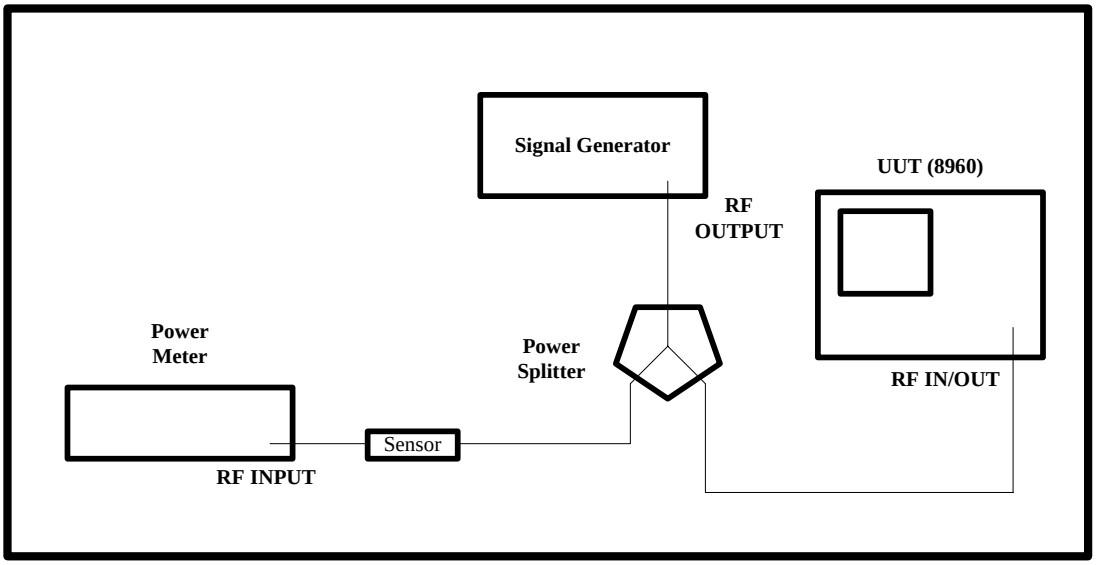
Test Equipment:

- Agilent EPM Power Meter
- Agilent E9301A Power Sensor
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator with CDMA option

Connect ID:

- ESG + SPLITTER + PM CONNECT

Setup:



Note: Connect the time-bases together. For C2K, Connect the signal generator EVENT1 to the 8960's TRIGGER INPUT.
Connect the power sensor directly to the power splitter; do not use a cable. Connect the power splitter to the test set with a short Type-N adapter. The cable between the power splitter and signal generator is not critical.

Test Methodology:

The signal from the signal generator is split into two paths: one goes to the spectrum analyzer the other to the test set. The same measurements on the modulated signals are made on both instruments. For all measurements, the two readings should be the same; any difference represents a measurement error. Measure CDMA2000 then compare in accordance with: Result=(8960_cdma)-(PM_cdma).

C2K Analyzer Average Power Accuracy Data Points

Test Conditions	Minimum (dB)	Maximum (dB)
850 MHz		
+3 dBm	-0.269	+0.253
0 dBm	-0.269	+0.253
-3 dBm	-0.269	+0.253
-6 dBm	-0.269	+0.253
-9 dBm	-0.269	+0.253
1850 MHz		
+3 dBm	-0.324	+0.301
0 dBm	-0.324	+0.301
-3 dBm	-0.324	+0.301
-6 dBm	-0.324	+0.301
-9 dBm	-0.324	+0.301

C2K Analyzer Tuned Channel Power Accuracy

Overview:

This procedure tests the accuracy of the tuned channel power detector in the RF analyzer. This RF analyzer performance is tested for the **CDMA2000** applications**.**

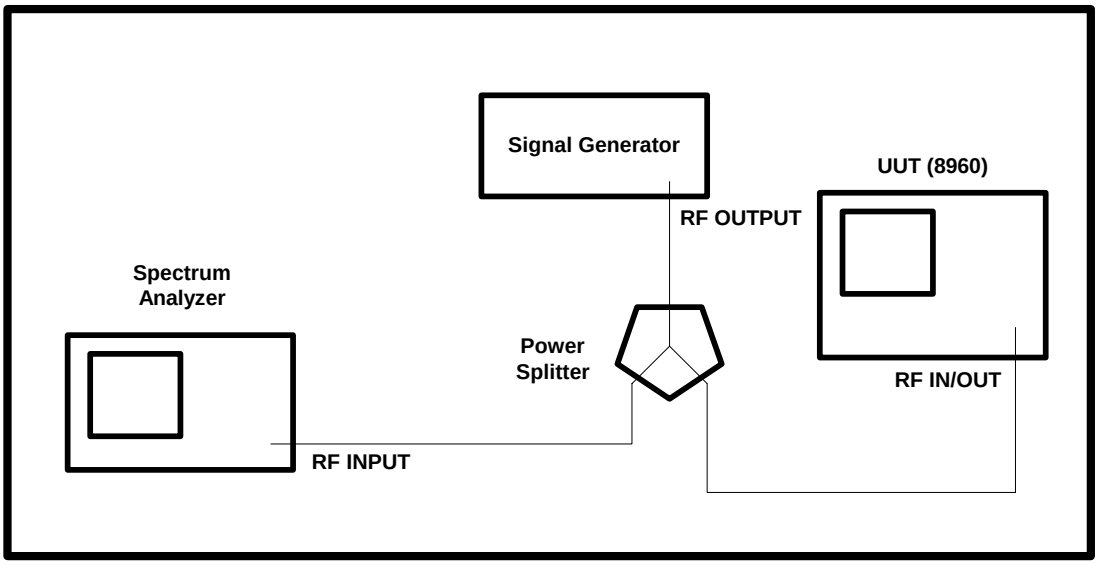
Test Equipment:

- Agilent PSA series Spectrum Analyzer with CDMA option
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator with CDMA option

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time-bases together. For C2K, Connect the signal generator EVENT1 to the 8960's TRIGGER INPUT and PSA's rear TRIGGER IN.

Test Methodology:

Setup the 8960's receiver to the expected power and frequency as specified by the data point. Apply CW signal from the source to the 8960 and PSA. Measure the power with the 8960 and the PSA. Apply the modulated signal from the source at the same frequency and level. This is an IS-95 signal with reverse pilot channel only. Calculate the final results as follows:
(Psa_cw-Psa_cdma) - (8960_cw-8960_cdma).

C2K Analyzer Tuned Channel Power Accuracy Data Points

Test Conditions	Minimum (dB)	Maximum (dB)
834 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
914 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
1760 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1

-46 dBm	-1	+1
-56 dBm	-1	+1
1880 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
1960 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1

1xEV-DO Generator Modulation Performance

Overview:

This procedure tests the ability of the I/Q modulator in the RF generator to accurately generate a 1xEV-DO modulated signal. This RF generator performance is tested for the **1xEV-DO** applications**.**

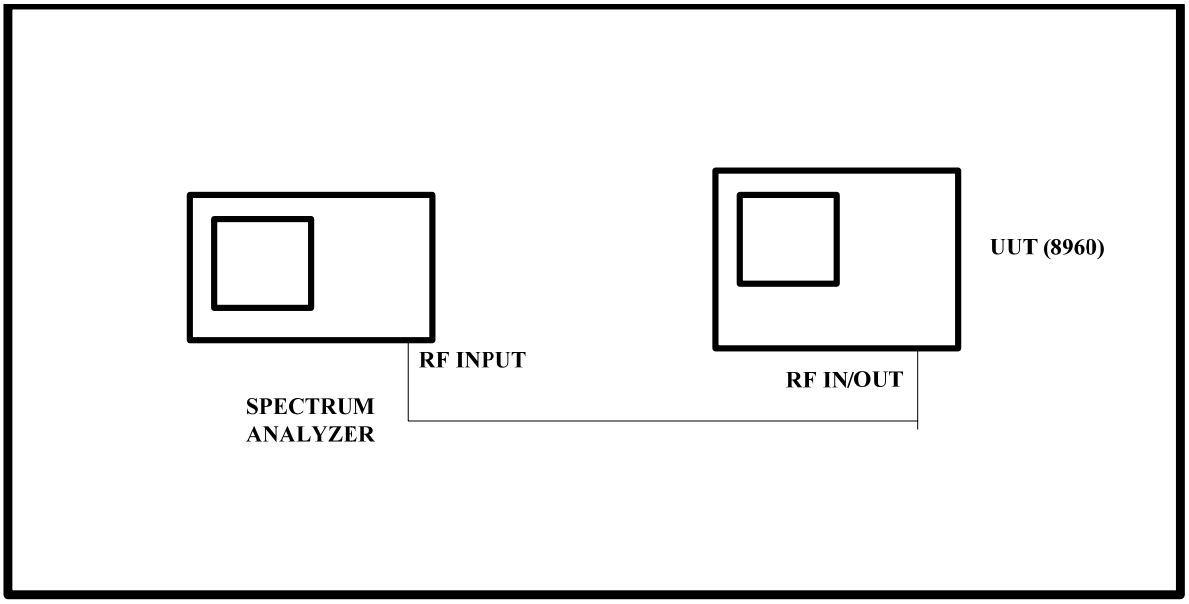
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with 1xEV option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together. And Connect the rear TRIG OUT of 8960 to the front EXT TRIGGER INPUT of PSA.

Test Methodology:

The purpose of this test is to verify that the IQ Modulation Process of the 8960 is operating to specification. This test verifies that most of the base-band modulation process is working and that the RF output does not excessively distort the signal. Pilot Sync, and Paging channels are the same for IS-95 and CDMA2000, so the signal can be treated as an IS-95 signal even when generated as a 1xEV-DO signal.

1xEV-DO Generator Modulation Performance Data Points

Test Conditions	Minimum	Maximum
870 MHz		
RHO	0.99	
EVM		10
1840 MHz		
RHO	0.99	
EVM		10
1950 MHz		
RHO	0.99	
EVM		10
2150 MHz		
RHO	0.99	
EVM		10

1xEV-DO Analyzer Modulation Accuracy

Overview:

This procedure tests the ability of the analyzer to accurately measure the modulation of a 1xEV-DO modulated signal. This analyzer performance is tested for the **1xEV-DO** applications**.**

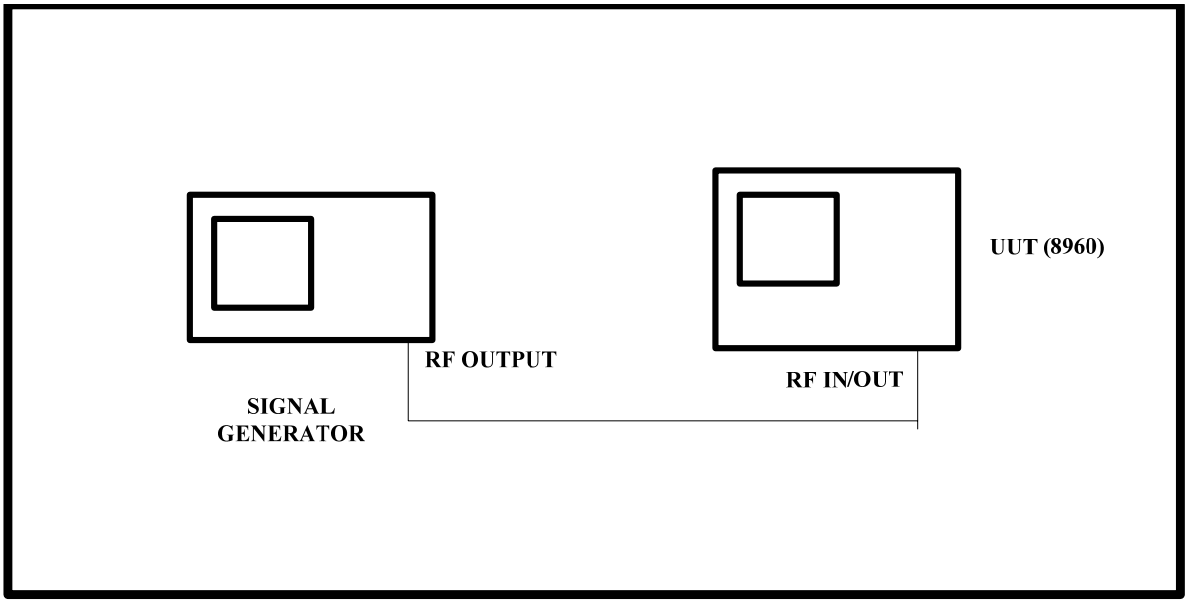
Test Equipment:

- Agilent ESG Series Signal Generator with Arbitrary Waveform Generator

Connect ID:

- ESG CONNECT

Setup:



Note: Connect the time-bases together. Connect the signal generator EVENT1 to the 8960's TRIGGER INPUT.

Test Methodology:

An arbitrary with know characteristics is generated from the ESG. The 8960 makes a Residual RHO, Residual EVM, Residual Time Error and Frequency Error and each data point.

1xEV Analyzer Modulation Accuracy Data Points

Test Conditions	Minimum	Maximum
900 MHz		
-4 dBm		
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
-16 dBm		
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
-25 dBm		
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
1900 MHz		
-4 dBm		
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
-16 dBm		
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15
-25 dBm		
Residual RHO	0.999	
Residual EVM		4
Frequency Error	-15	+15

1xEV-DO Analyzer Tuned Channel Power Accuracy

Overview:

This procedure tests the accuracy of the tuned channel power detector in the RF analyzer. The analyzer performance is tested for the **1xEV-DO** applications**.**

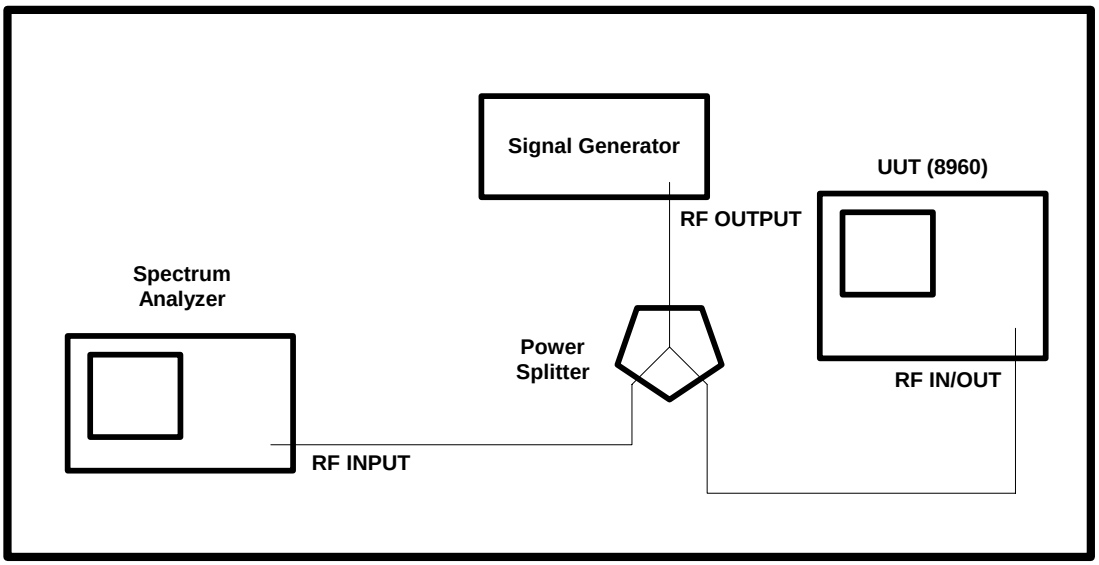
Test Equipment:

- Agilent PSA series Spectrum Analyzer with CDMA Option
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator with CDMA Option

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time-bases together. For C2K, Connect the signal generator EVENT1 to the 8960's TRIGGER INPUT and PSA's rear TRIGGER IN.

Test Methodology:

Setup the 8960's receiver to expected power and frequency as specified by the data point. Apply CW signal from the source to the 8960 and PSA. Measure the power with the 8960 and the PSA. Apply the modulated signal from the source at the same frequency and level. This is an IS-95 signal with reverse pilot channel only. Calculate the final results as follows:
(8960_cw-8960_cdma)-(Psa_cw-Psa_cdma) .

1xEV-DO Analyzer Tuned Channel Power Accuracy Data Points

Test Conditions	Minimum (dB)	Maximum (dB)
834 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
914 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
1760 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1

-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
1880 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
1960 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1

WCDMA Generator Digital Power Accuracy

Overview:

This procedure tests the relative output level accuracy of the RF generator with modulation and the AWGN source turned on. The WCDMA generator performance is tested on the **WCDMA and HPDPA** applications**.**

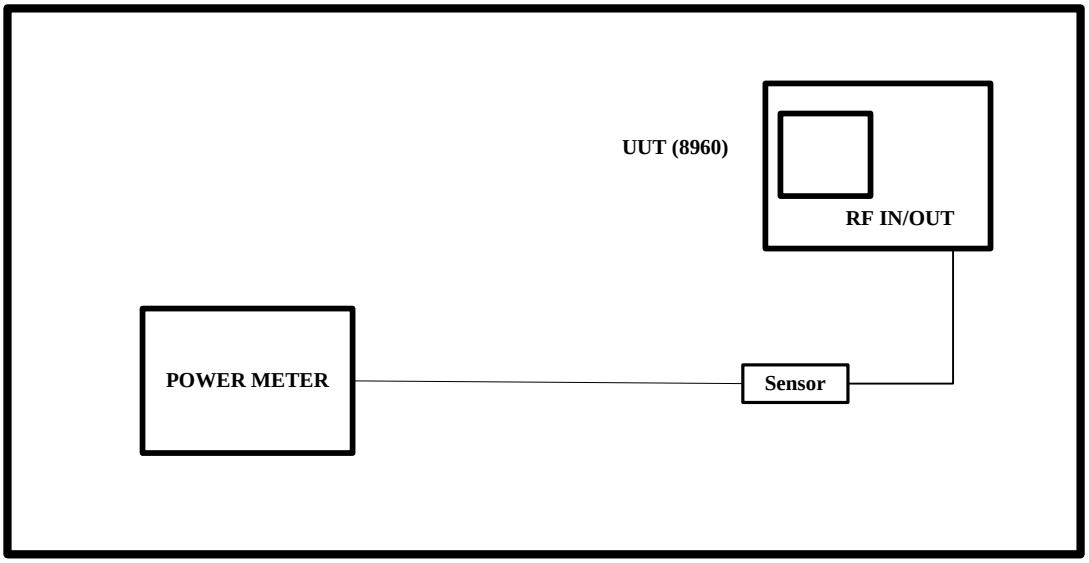
Recommended Test Equipment:

- Agilent EPM series Power Meter
- Agilent E9301A Average Power Sensor

Connect ID:

- POWER METER CONNECT

Setup:



Test Methodology:

The purpose for this test is to verify output level accuracy with modulation and the AWGN source turned on relative to CW signal. The Power Receiver is setup to measure power in a given channel for each test point set. The 8960 outputs a CW signal at the specified frequency and level specified in the data points. Measure a CW and WCDMA modulated signal then compare in accordance with: Mod_pwr-CW_pwr

WCDMA Generator Digital Power Accuracy Data Points (downlink)

Test Conditions	Minimum	Maximum
870 MHz		
AWGN Off		
-16.94 dBm	-1.10	+1.10
-21.94 dBm	-1.10	+1.10
-26.94 dBm	-1.10	+1.10
AWGN On		
-16.94 dBm	-1.20	+1.20
-21.94 dBm	-1.20	+1.20
-26.94 dBm	-1.20	+1.20
1500 MHz		
AWGN Off		
-18.61 dBm	-1.10	+1.10
-23.61 dBm	-1.10	+1.10
-28.61 dBm	-1.10	+1.10
AWGN On		
-18.61 dBm	-1.20	+1.20
-23.61 dBm	-1.20	+1.20
-28.61 dBm	-1.20	+1.20
1930 MHz		
AWGN Off		
-18.61 dBm	-1.10	+1.10
-23.61 dBm	-1.10	+1.10
-28.61 dBm	-1.10	+1.10
AWGN On		

-18.61 dBm	-1.20	+1.20
-23.61 dBm	-1.20	+1.20
-28.61 dBm	-1.20	+1.20
2360 MHz		
AWGN Off		
-18.61 dBm	-1.10	+1.10
-23.61 dBm	-1.10	+1.10
-28.61 dBm	-1.10	+1.10
AWGN On		
-18.61 dBm	-1.20	+1.20
-23.61 dBm	-1.20	+1.20
-28.61 dBm	-1.20	+1.20

HSDPA Generator Digital Power Accuracy Data Points

Test Conditions	Minimum	Maximum
870 MHz		
AWGN Off		
-16.94 dBm	-1.10	+1.10
-21.94 dBm	-1.10	+1.10
-26.94 dBm	-1.10	+1.10
AWGN On		
-16.94 dBm	-1.20	+1.20
-21.94 dBm	-1.20	+1.20
-26.94 dBm	-1.20	+1.20
1500 MHz		
AWGN Off		
-18.61 dBm	-1.10	+1.10
-23.61 dBm	-1.10	+1.10
-28.61 dBm	-1.10	+1.10
AWGN On		
-18.61 dBm	-1.20	+1.20
-23.61 dBm	-1.20	+1.20
-28.61 dBm	-1.20	+1.20
1930 MHz		
AWGN Off		
-18.61 dBm	-1.10	+1.10
-23.61 dBm	-1.10	+1.10
-28.61 dBm	-1.10	+1.10
AWGN On		
-18.61 dBm	-1.20	+1.20
-23.61 dBm	-1.20	+1.20
-28.61 dBm	-1.20	+1.20
2360 MHz		
AWGN Off		
-18.61 dBm	-1.10	+1.10
-23.61 dBm	-1.10	+1.10
-28.61 dBm	-1.10	+1.10
AWGN On		
-18.61 dBm	-1.20	+1.20
-23.61 dBm	-1.20	+1.20
-28.61 dBm	-1.20	+1.20

WCDMA Generator Modulation Performance

Overview:

This procedure tests the ability of the I/Q modulator in the RF generator to accurately generate a WCDMA modulated signal. This RF generator performance is tested for the **WCDMA** applications.

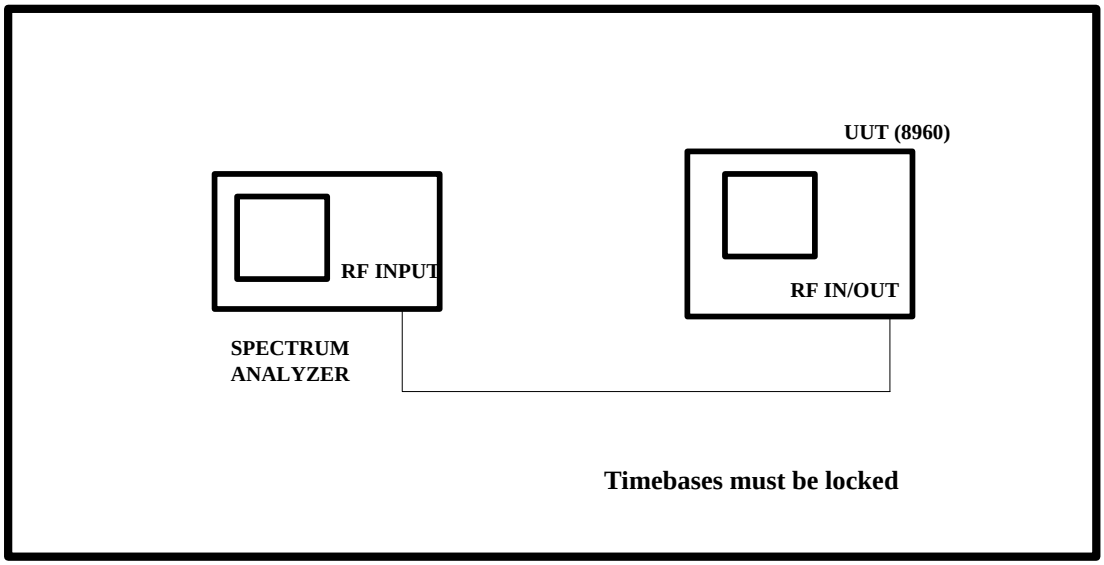
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with WCDMA Option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together. Connect UUT's rear Trigger Out to PSA's front Ext Trigger Input.

Test Methodology:

For EVM and Carrier Feed through measurement, the unit is set up to generate a signal with data only on a CPICH (emulates QPSK). The purpose of this test is to verify that the IQ Modulation Process of the 8960 is operating to specification. This test verifies that most of the base band modulation process is working and that the RF output does not excessively distort the signal.

WCDMA Generator Modulation Performance Data Points (downlink)

Test Conditions	Maximum
800 MHz	
IQ OFFSET	-25 dBm
EVM	10 %rms
1000 MHz	
IQ OFFSET	-25 dBm
EVM	10 %rms
1550 MHz	

IQ OFFSET	-25 dBm
EVM	10 %rms
1850 MHz	
IQ OFFSET	-25 dBm
EVM	10 %rms
2150 MHz	
IQ OFFSET	-25 dBm
EVM	10 %rms
2360 MHz	
IQ OFFSET	-25 dBm
EVM	10 %rms

WCDMA Analyzer Level Accuracy

Overview:

This procedure tests the accuracy of the Thermal detector using the WCDMA power level analyzer. This level accuracy is tested for the following technologies:

- **WCDMA**

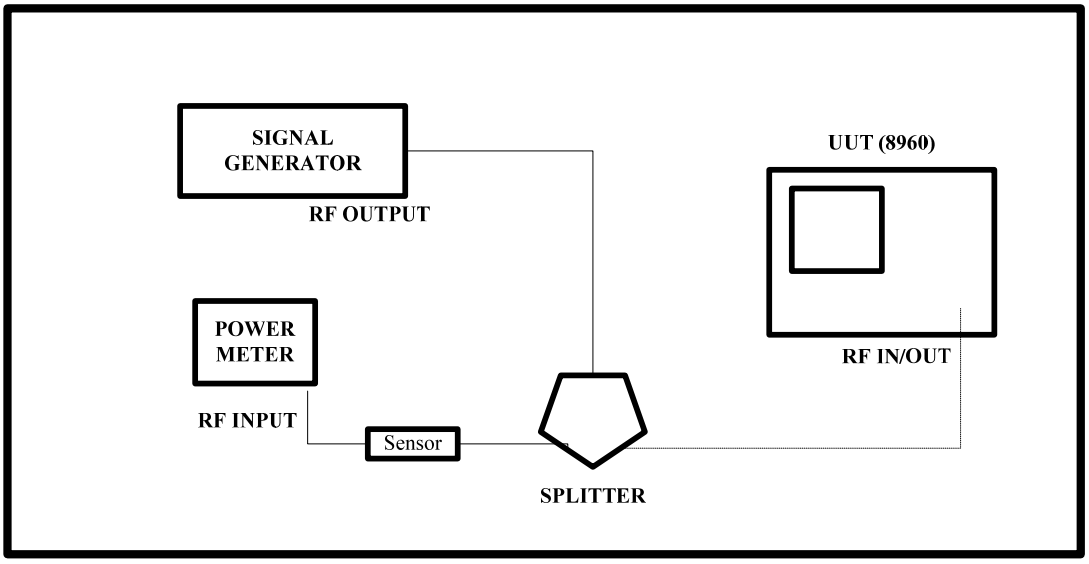
Test Equipment:

- Agilent EPM Series Power Meter
- Agilent E9304A Average Power Sensor
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator with WCDMA options

Connect ID:

- ESG + SPLITTER + PM CONNECT

Setup:



Note: Connect the power sensor directly to the power splitter do not use a cable. Connect the power splitter to the test set with a short Type-N adapter. The cable between the power splitter and signal generator is not critical. Connect Signal Generater's Event 1 to UUT's rear Trig In.

Test Methodology:

The signal generator is set to generate a WCDMA signal determined by the data point being measured. The signal is equally split into two paths: one goes to a power meter, the other to the test set. The two readings should be the same; any difference represents a measurement error. Calculate the final results as follows: (8960_wcdma)-(Mod_pwr)

WCDMA Analyzer Level Accuracy Data Points (uplink)

Test Conditions	Minimum (dB)	Maximum (dB)
850 MHz Carrier		
7.00 dBm	-0.269	0.253
3.00 dBm	-0.269	0.253
-1.00 dBm	-0.269	0.253
-5.00 dBm	-0.269	0.253
-10.00 dBm	-0.269	0.253
1850 MHz Carrier		
7.00 dBm	-0.324	0.301
3.00 dBm	-0.324	0.301
-1.00 dBm	-0.324	0.301
-5.00 dBm	-0.324	0.301
-10.00 dBm	-0.324	0.301
2310 MHz Carrier		
7.00 dBm	-0.324	0.301
3.00 dBm	-0.324	0.301
-1.00 dBm	-0.324	0.301
-5.00 dBm	-0.324	0.301
-10.00 dBm	-0.324	0.301

WCDMA Analyzer Channel Power Accuracy

Overview:

This procedure tests is to determine the relative accuracy of the channel power measurement in the DUT analyzer over various level conditions with both CW and WCDMA signals applied. This RF analyzer performance is tested for the **WCDMA** applications**.**

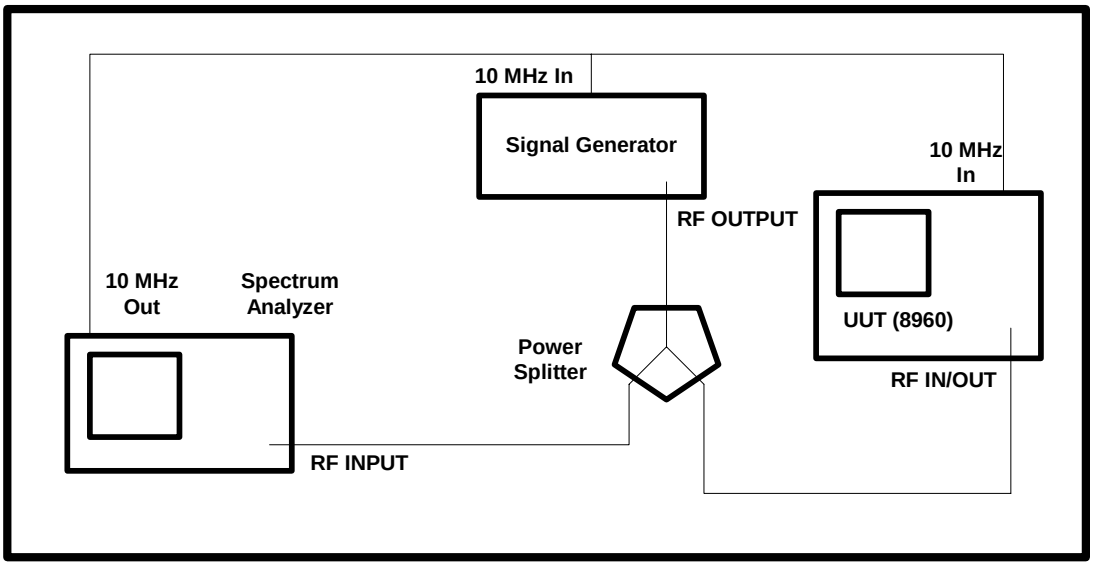
Test Equipment:

- Agilent PSA series Spectrum Analyzer with WCDMA Option
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time-bases together. Connect the signal generator EVENT1 to the 8960's TRIGGER INPUT and PSA's rear TRIGGER IN.

Test Methodology:

Setup the 8960's receiver to expected power and frequency as specified by the data-point. Apply the CW signal from the source to the 8960 and PSA at the specified level and frequency. Measure the power with the 8960 and the PSA. Apply the WCDMA uplink modulated signal from the source at the same frequency and level. This is signal with reverse pilot channel only. Calculate the final results as follows: (Psa_cw - Psa_wcdma) - (8960_cw - 8960_wcdma)

WCDMA Analyzer Channel Power Accuracy Data Points (uplink)

Test Conditions	Minimum (dB)	Maximum (dB)
834 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
914 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
1760 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1

-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
1880 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
1960 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1
2310 MHz		
-1 dBm	-1	+1
-6 dBm	-1	+1
-16 dBm	-1	+1
-26 dBm	-1	+1
-36 dBm	-1	+1
-46 dBm	-1	+1
-56 dBm	-1	+1

WCDMA ACLR Residual Accuracy

Overview:

The purpose of the ACLR measurement is to determine the residual noise performance of the unit with a known WCDMA signal applied.

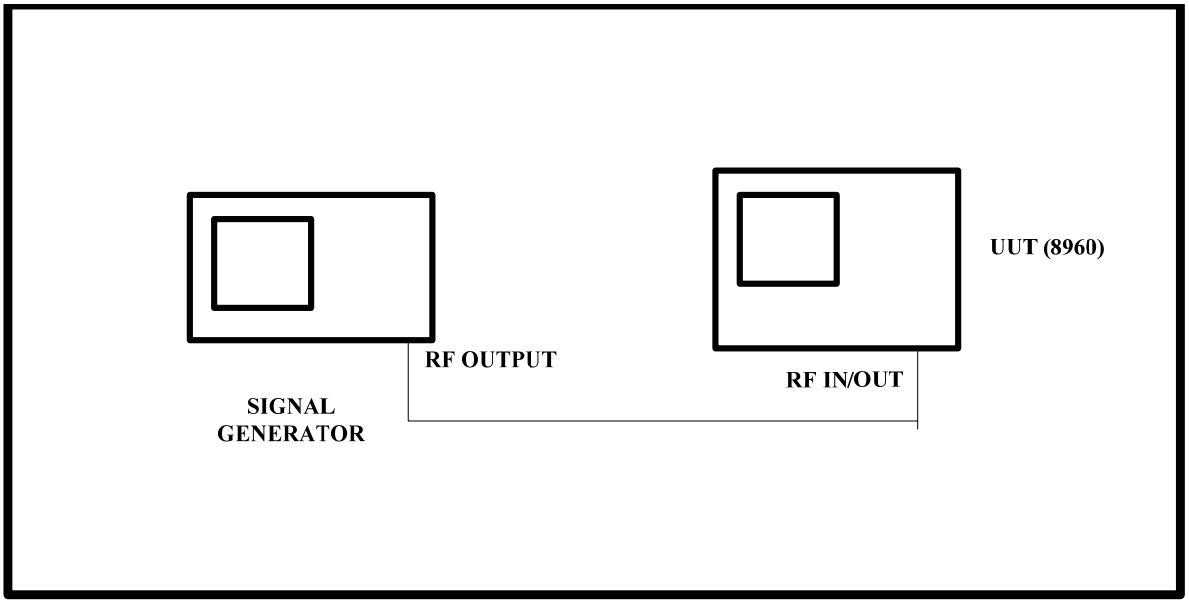
Test Equipment:

- Agilent ESG Series Signal Generator with WCDMA Options

Connect ID:

- ESG CONNECT

Setup:



Note: Connect the time-bases together. Connect the signal generator EVENT1 to the 8960's TRIGGER INPUT.

Test Methodology:

The ACLR residual noise measurement is made by applying a WCDMA signal to the UUT and observing what ACLR levels the MOM measures.

WCDMA ACLR Residual Data Points

Test Conditions	Maximum
814 MHz, 5dBm	
-5 MHz Offset	-53 dBc
+5 MHz Offset	-53 dBc
-10 MHz Offset	-63 dBc
+10 MHz Offset	-63 dBc
934 MHz, 5dBm	
-5 MHz Offset	-53 dBc
+5 MHz Offset	-53 dBc
-10 MHz Offset	-63 dBc
+10 MHz Offset	-63 dBc

WCDMA ACLR Accuracy

Overview:

The purpose of the ACLR measurement is to determine the residual noise performance of the unit with a known WCDMA signal applied.

Test Equipment:

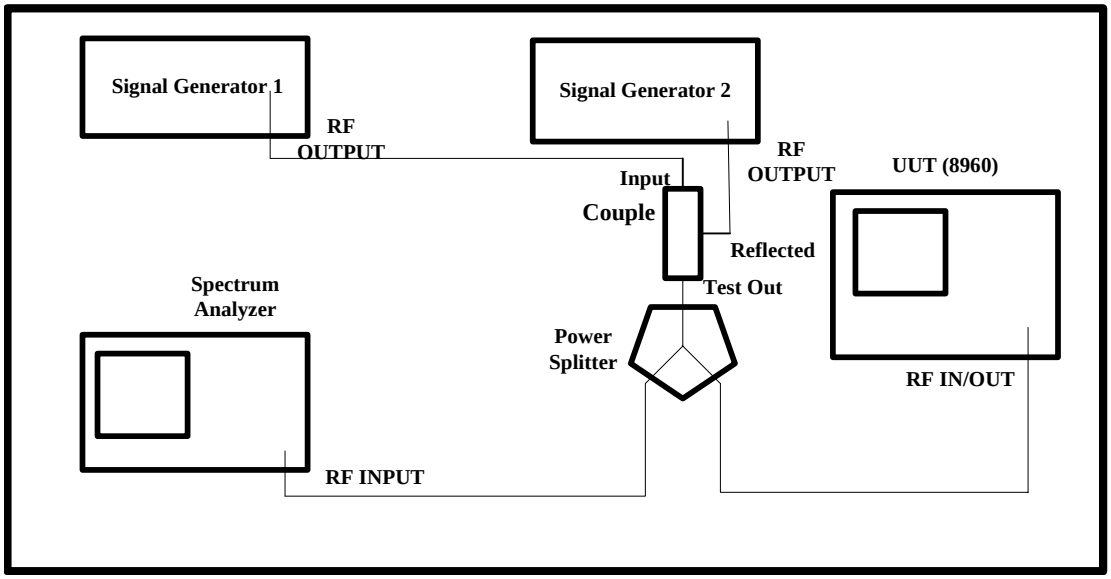
- Agilent PSA series Spectrum Analyzer with WCDMA option
- Agilent 11667A Power Splitter

- Agilent 86205A Coupler
- Agilent E443XB Signal Generator w/opt 100
- Agilent E443XB Signal Generator w/opt 100

Connect ID:

- PSA + ESG + ESG + COUPLER CONNECT

Setup:



Note: Connect the time bases together.

Test Methodology:

The DUT receiver is set to the expected frequency and power as specified by the data point. Both sources produce a WCDMA uplink repeating signal with the following channel setup: DPCCH +1 DPDCH. One source is set to the expected frequency and power +7 dBm (as applied to the DUT), and the other at the offsets from that frequency and level specified in the data point +26 dBm. These two signals are combined together through the coupler. The PSA is used to accurately measure the relative power of the offset signal by;

1. Measuring power in the “in channel” WCDMA signal using 3.84 MHz bandwidth band power markers;
2. Retuning the PSA to the offset frequency and measuring power in that WCDMA signal also using 3.84 MHz BW band power markers, and;
3. Subtracting result #2 from result #1

WCDMA ACLR Accuracy Data Points (uplink)

Test Conditions	Minimum	Maximum
814 MHz +5dBm	(dB)	
-5 MHz Offset	-0.8	0.8
+5 MHz Offset	-0.8	0.8
-10 MHz Offset	-0.8	0.8
+10 MHz Offset	-0.8	0.8

934 MHz +5dBm		
-5 MHz Offset	-0.8	0.8
+5 MHz Offset	-0.8	0.8
-10 MHz Offset	-0.8	0.8
+10 MHz Offset	-0.8	0.8
1760 MHz +5dBm		
-5 MHz Offset	-0.8	0.8
+5 MHz Offset	-0.8	0.8
-10 MHz Offset	-0.8	0.8
+10 MHz Offset	-0.8	0.8
1980 MHz +5dBm		
-5 MHz Offset	-0.8	0.8
+5 MHz Offset	-0.8	0.8
-10 MHz Offset	-0.8	0.8
+10 MHz Offset	-0.8	0.8
2310 MHz +5dBm		
-5 MHz Offset	-0.8	0.8
+5 MHz Offset	-0.8	0.8
-10 MHz Offset	-0.8	0.8
+10 MHz Offset	-0.8	0.8

WCDMA Analyzer Modulation Accuracy

Overview:

This procedure tests the ability of the analyzer to accurately measure the modulation of a WCDMA modulated signal. This WCDMA analyzer performance is tested for the **WCDMA** applications**.**

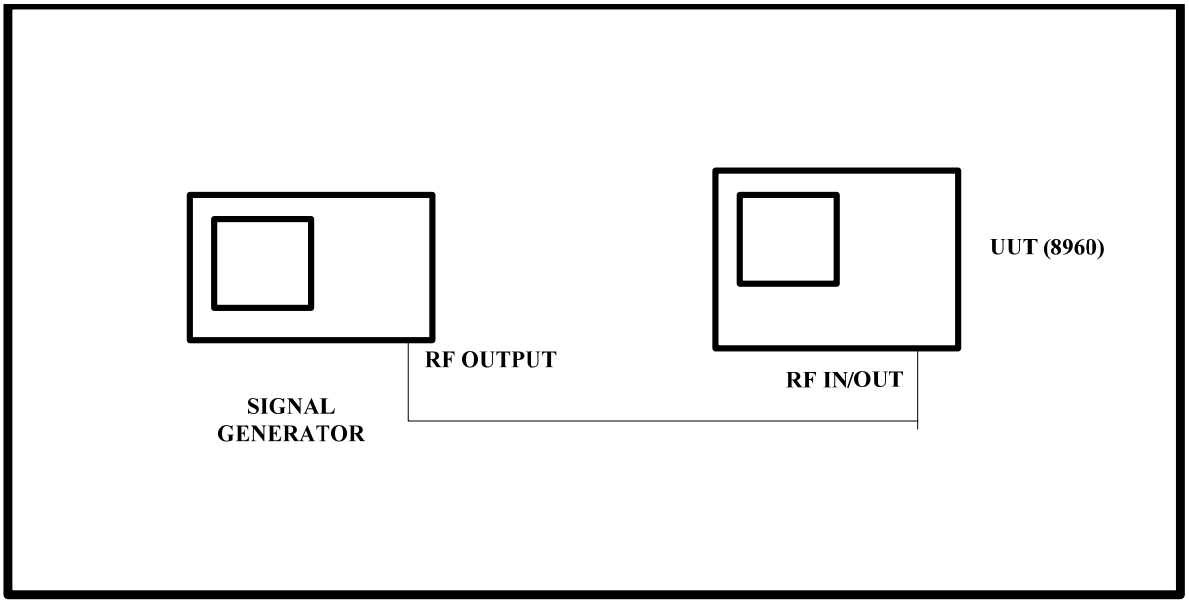
Test Equipment:

- Agilent ESG Series Signal Generator with WCDMA options

Connect ID:

- ESG CONNECT

Setup:



Note: Connect the time-bases together. Connect the signal generator EVENT1 to the 8960's TRIGGER INPUT.

Test Methodology:

Apply test signal from the ESG (a WCDMA arbitrary waveform with known characteristics populated downlink waveform with a 3 dB crest factor) to the DUT RF Input at the specified level and frequency.

WCDMA Analyzer Modulation Accuracy Data Points (uplink)

Test Conditions	Minimum	Maximum
900 MHz		
5 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
-4 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
-16 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
-24 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
1980 MHz		
5 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
-4 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
-16 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
-24 dBm		
Residual EVM (%rms)	0	2.20

Frequency Error (Hz)	-5	+5
2310 MHz		
5 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
-4 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
-16 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5
-24 dBm		
Residual EVM (%rms)	0	2.20
Frequency Error (Hz)	-5	+5

ANITE Generator Modulation Performance

Overview:

The modulation accuracy for this product is specified in terms of peak phase error, rms phase error and frequency error for GMSK modulation (GSM and GPRS), and EVM and origin offset suppression for 8PSK modulation (EGPRS).
This RF generator performance is tested for the **ANITE (E6590A)** application.

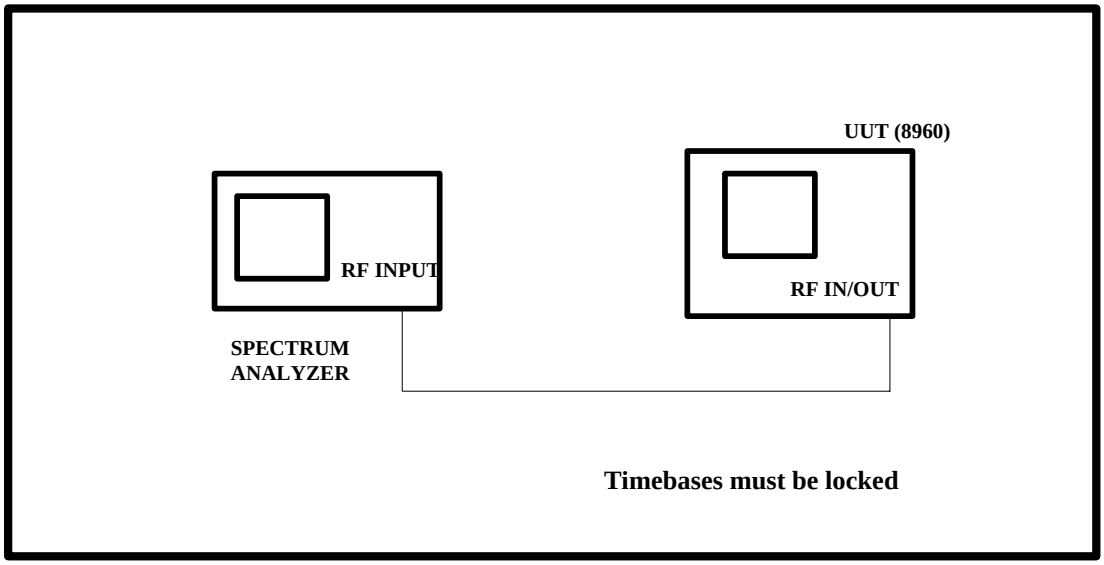
Recommended Test Equipment:

- Agilent PSA series Signal Analyzer with GSM option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together. Connect UUT's rear Trigger Out to PSA's front Ext Trigger Input.

Test Methodology:

UUT provides the modulated signals at the certain frequencies and levels. PSA measures the performance of the modulated signal.

ANITE Generator Spurious

Overview:

This procedure tests the RF generator for spurious leakage. RF spectral purity is tested for the following technologies:

- **Anite Application (E6590A)**

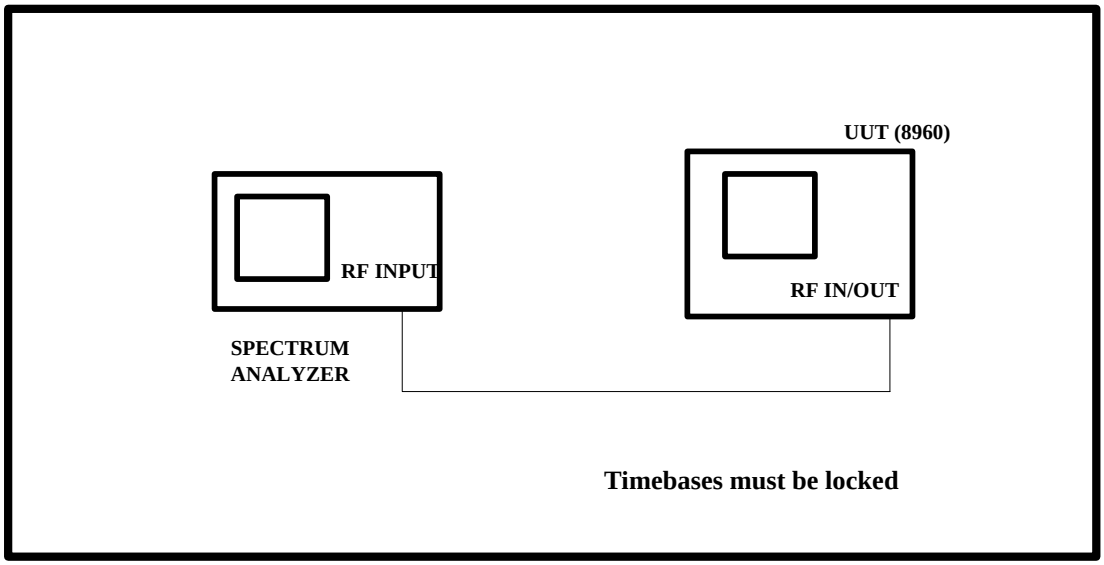
Recommended Test Equipment:

- Agilent PSA Spectrum Analyzer (required frequency range: 400 to 6000 MHz)
- Agilent 8491A Opt 010 10 dB Fixed Attenuator

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together.

Test Methodology:

Apply an unmodulated CW signal to the spectrum analyzer. Range the Spectrum Analyzer appropriate to trigger a level measurement at the frequency of the test as well as at the Harmonics, Sub-harmonics and Spurious of the tests.

ANITE Generator Spurious Points

Test Conditions	Maximum (dBc)
956 MHz Carrier	

Test Conditions	Maximum (dBc)
-26 dBm Carrier Level	
955.884 MHz	-55.00
956.116 MHz	-55.00
955.876 MHz	-55.00
956.124 MHz	-55.00
955.857 MHz	-55.00
956.143 MHz	-55.00
955.849 MHz	-55.00
956.151 MHz	-55.00
955.792 MHz	-55.00
956.208 MHz	-55.00
951 MHz	-68.00
961 MHz	-68.00
946 MHz	-68.00
966 MHz	-68.00
936 MHz	-68.00
976 MHz	-68.00
1990 MHz Carrier	
-27 dBm Carrier Level	
1989.884 MHz	-55.00
1989.876 MHz	-55.00
1990.116 MHz	-55.00
1990.124 MHz	-55.00
1989.857 MHz	-55.00
1989.849 MHz	-55.00
1990.143 MHz	-55.00
1990.151 MHz	-55.00
1989.792 MHz	-55.00
1990.208 MHz	-55.00
1985 MHz	-68.00
1995 MHz	-68.00
1980 MHz	-68.00
2000 MHz	-68.00
1970 MHz	-68.00
2010 MHz	-68.00

ANITE Generator Level Accuracy w/o Hopping

Overview:

This test will be used to qualify the additional Source Level Accuracy error from frequency with no hopping. Testing will be done in CW mode. The error will be the level delta between a reference measurement and the hop frequency. The ANITE generator performance is tested on the **ANITE (E6590A)** application**.**

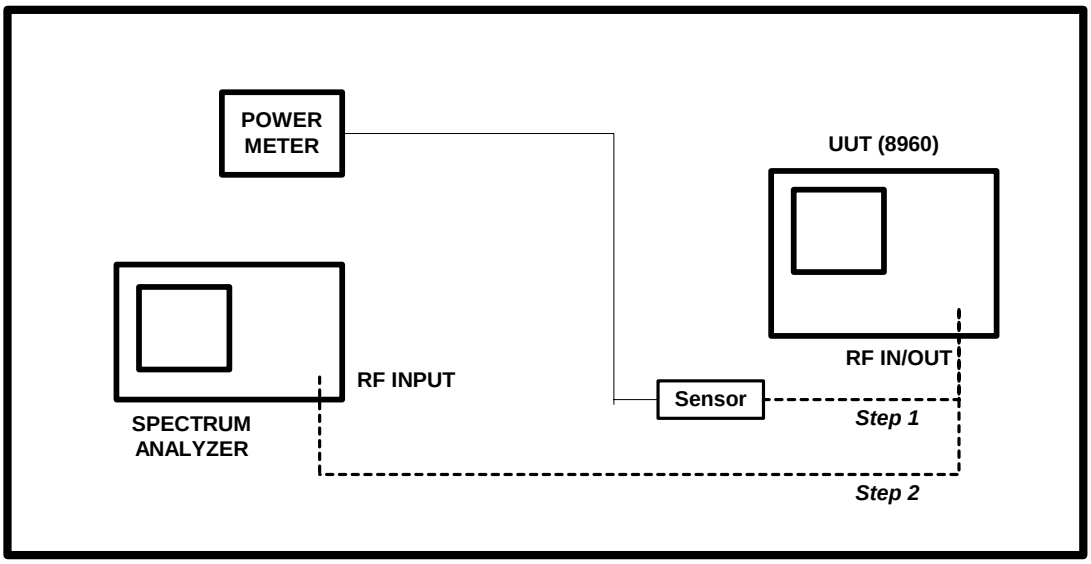
Recommended Test Equipment:

- Agilent EPM series Power Meter
- Agilent E4412A Power Sensor
- Agilent PSA series Spectrum Analyzer

Connect ID:

- POWER METER CONNECT
- SPECTURM ANALYZER CONNECT

Setup:



Test Methodology:

The purpose for this test is to verify output level accuracy with source turned on relative to CW signal. The 8960 outputs a CW signal at the specified frequency and level specified in the data points. Power Meter measures the higher level and PSA verifies the lower level.

ANITE Generator Level No Hopping Accuracy Data Points

Test Conditions	Minimum	Maximum
478.2 MHz		
-30 dBm	-.08 dB	+0.8 dB
-40 dBm	-.08 dB	+0.8 dB
-50 dBm	-.08 dB	+0.8 dB
-60 dBm	-.08 dB	+0.8 dB
-65 dBm	-.08 dB	+0.8 dB
881.5 MHz		
-30 dBm	-.08 dB	+0.8 dB
-40 dBm	-.08 dB	+0.8 dB
-50 dBm	-.08 dB	+0.8 dB
-60 dBm	-.08 dB	+0.8 dB
-65 dBm	-.08 dB	+0.8 dB
940.5 MHz		
-30 dBm	-.08 dB	+0.8 dB
-40 dBm	-.08 dB	+0.8 dB
-50 dBm	-.08 dB	+0.8 dB
-60 dBm	-.08 dB	+0.8 dB
-65 dBm	-.08 dB	+0.8 dB
1842.5 MHz		
-30 dBm	-.08 dB	+0.8 dB
-40 dBm	-.08 dB	+0.8 dB
-50 dBm	-.08 dB	+0.8 dB

-60 dBm	-.08 dB	+0.8 dB
-65 dBm	-.08 dB	+0.8 dB
1960 MHz		
-30 dBm	-.08 dB	+0.8 dB
-40 dBm	-.08 dB	+0.8 dB
-50 dBm	-.08 dB	+0.8 dB
-60 dBm	-.08 dB	+0.8 dB
-65 dBm	-.08 dB	+0.8 dB
2140 MHz		
-30 dBm	-.08 dB	+0.8 dB
-40 dBm	-.08 dB	+0.8 dB
-50 dBm	-.08 dB	+0.8 dB
-60 dBm	-.08 dB	+0.8 dB
-65 dBm	-.08 dB	+0.8 dB

ANITE Analyzer Level Accuracy

Overview:

This procedure tests the ability of the analyzer to accurately measure the modulation of a GMSK modulated signal. This GMSK analyzer performance is tested for the **ANITE (E6590A)** application**.**

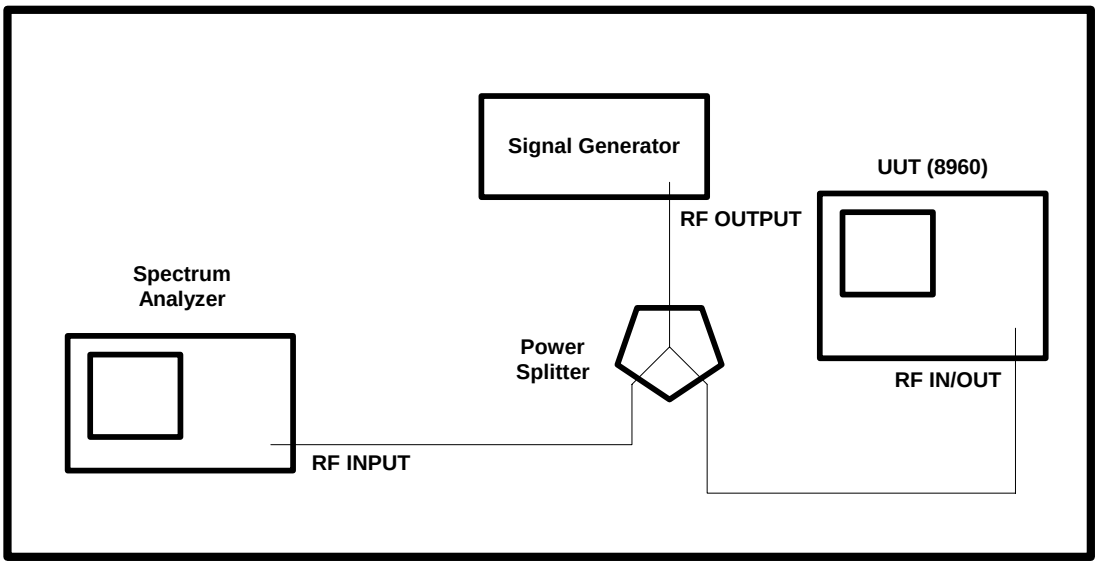
Test Equipment:

- Agilent PSA series Specturm Analyzer with GSM option
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator (with option UND)

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time bases together. Connect Signal Generator's rear EVENT 1 to UUT's rear TRIGGER IN and PSA's rear TRIG IN.

Test Methodology:

The source would generate a GMSK ARB at the specified frequency and level + 6 dBm. The results measured by the DUT would be compared to the results from the PSA (fetch:txp?): Results=Psa_array(3)-Uut_array(2)/1000

ANITE Analyzer Level Accuracy Data Points

Test Conditions	Minimum (dB)	Maximum (dB)
10 dBm		
450.6 MHz	-0.8	+0.8
485.8 MHz	-0.8	+0.8
824.2 MHz	-0.8	+0.8
848.8 MHz	-0.8	+0.8
876.2 MHz	-0.8	+0.8
914.8 MHz	-0.8	+0.8
1710.2 MHz	-0.8	+0.8
1784.8 MHz	-0.8	+0.8
1850.2 MHz	-0.8	+0.8
1909.8 MHz	-0.8	+0.8
5 dBm		
450.6 MHz	-0.8	+0.8
485.8 MHz	-0.8	+0.8
824.2 MHz	-0.8	+0.8
848.8 MHz	-0.8	+0.8
876.2 MHz	-0.8	+0.8
914.8 MHz	-0.8	+0.8
1710.2 MHz	-0.8	+0.8
1784.8 MHz	-0.8	+0.8
1850.2 MHz	-0.8	+0.8
1909.8 MHz	-0.8	+0.8
0 dBm		
450.6 MHz	-0.8	+0.8
485.8 MHz	-0.8	+0.8
824.2 MHz	-0.8	+0.8
848.8 MHz	-0.8	+0.8
876.2 MHz	-0.8	+0.8
914.8 MHz	-0.8	+0.8
1710.2 MHz	-0.8	+0.8
1784.8 MHz	-0.8	+0.8
1850.2 MHz	-0.8	+0.8
1909.8 MHz	-0.8	+0.8
-5 dBm		
450.6 MHz	-0.8	+0.8
485.8 MHz	-0.8	+0.8
824.2 MHz	-0.8	+0.8
848.8 MHz	-0.8	+0.8
876.2 MHz	-0.8	+0.8
914.8 MHz	-0.8	+0.8
1710.2 MHz	-0.8	+0.8
1784.8 MHz	-0.8	+0.8
1850.2 MHz	-0.8	+0.8
1909.8 MHz	-0.8	+0.8
-10 dBm		
450.6 MHz	-0.8	+0.8

485.8 MHz	-0.8	+0.8
824.2 MHz	-0.8	+0.8
848.8 MHz	-0.8	+0.8
876.2 MHz	-0.8	+0.8
914.8 MHz	-0.8	+0.8
1710.2 MHz	-0.8	+0.8
1784.8 MHz	-0.8	+0.8
1850.2 MHz	-0.8	+0.8
1909.8 MHz	-0.8	+0.8
-15 dBm		
450.6 MHz	-0.8	+0.8
485.8 MHz	-0.8	+0.8
824.2 MHz	-0.8	+0.8
848.8 MHz	-0.8	+0.8
876.2 MHz	-0.8	+0.8
914.8 MHz	-0.8	+0.8
1710.2 MHz	-0.8	+0.8
1784.8 MHz	-0.8	+0.8
1850.2 MHz	-0.8	+0.8

ANITE Analyzer Frequency Error

Overview:

This procedure tests the ability of the analyzer to accurately measure the Frequency from a GMSK modulated signal. This GMSK frequency analyzer performance is tested for the **ANITE (E6590A)** application**.**

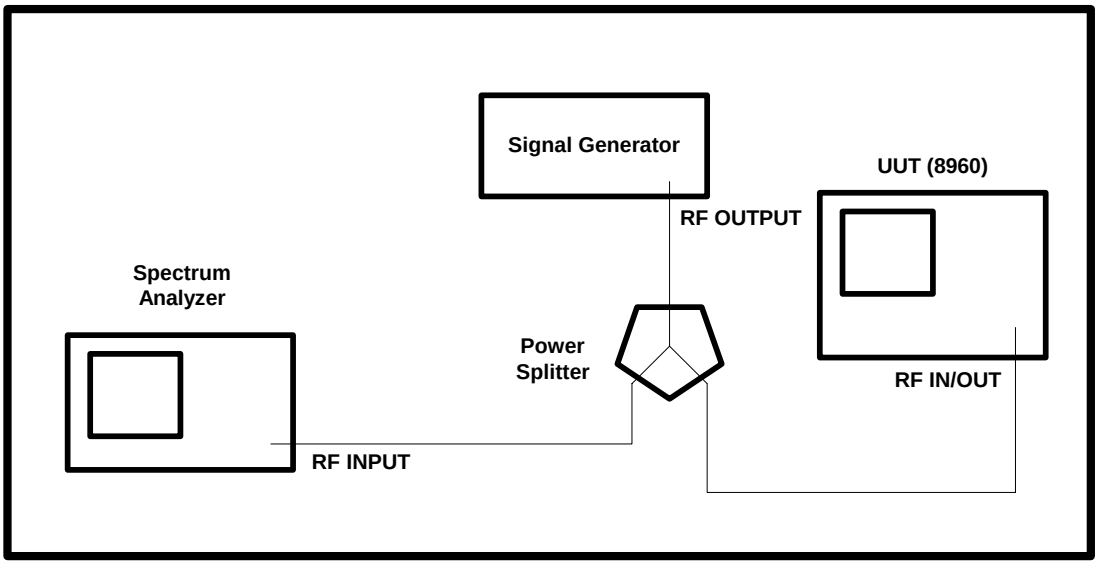
Test Equipment:

- Agilent PSA series Signal Analyzer with GSM option
- Agilent 11667A Power Splitter
- Agilent ESG Series Signal Generator (with option UND)

Connect ID:

- PSA + ESG CONNECT

Setup:



Note: Connect the time bases together. Connect Signal Generator's rear EVENT 1 to UUT's rear TRIGGER IN and PSA's rear TRIG IN.

Test Methodology:

The source would generate a GMSK ARB at the specified frequency and level + 6 dBm. The results measured by the DUT would be compared to the results from the PSA (fetch:pfer?): Results=Psa_array(4)-Uut_array(2)/1000

ANITE Analyzer Frequency Error Data Points

Test Conditions	Minimum (Hz)	Maximum (Hz)
0 dBm		
450.6 MHz	-12	+12
485.8 MHz	-12	+12
824.2 MHz	-12	+12
848.8 MHz	-12	+12
876.2 MHz	-12	+12
914.8 MHz	-12	+12
1710.2 MHz	-12	+12
1784.8 MHz	-12	+12
1850.2 MHz	-12	+12

ANITE Generator Level Hopping

Overview:

The modulation accuracy for this product is specified in terms of peak phase error, rms phase error and frequency error for GMSK modulation (GSM and GPRS), and EVM and origin offset suppression for 8PSK modulation (EGPRS).
This RF generator performance is tested for the **ANITE (E6590A)** application.

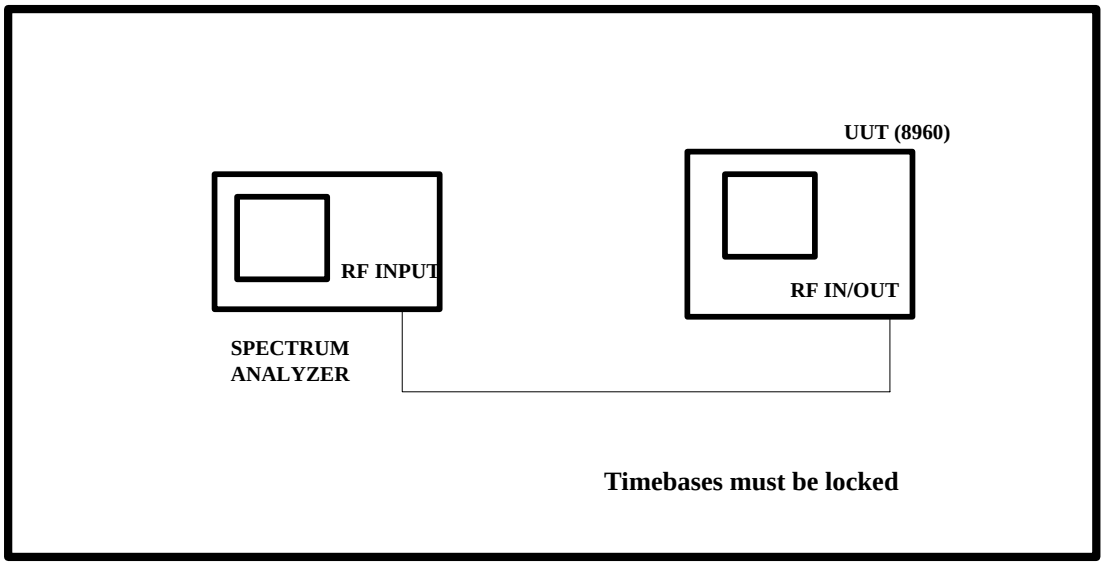
Recommended Test Equipment:

- Agilent PSA series Spectrum Analyzer with GSM option

Connect ID:

- SPECTRUM ANA CONNECT

Setup:



Note: Connect the time-bases together. Connect the signal generator PATTERN TRIG IN to the 8960's TRIGGER INPUT.

Test Methodology:

UUT provides the modulated signals at the certain frequencies and levels. PSA measures the levels.

ANITE Generator Level Hopping Data Points

Test Conditions	Minimum (dB)	Maximum (dB)
Ref Freq 478.2 MHz		
Hop Frequencies 460.6 – 495.8 MHz		
-30 dBm	-2	+2
-40 dBm	-2	+2
-50 dBm	-2	+2
-60 dBm	-2	+2
-70 dBm	-2	+2
-80 dBm	-2	+2
Ref Freq 881.5 MHz		
Hop Frequencies 869.2 – 893.8 MHz		
-30 dBm	-2	+2
-40 dBm	-2	+2
-50 dBm	-2	+2
-60 dBm	-2	+2
-70 dBm	-2	+2
-80 dBm	-2	+2
Ref Freq 940.5 MHz		
Hop Frequencies 921.2 – 959.8 MHz		
-30 dBm	-2	+2
-40 dBm	-2	+2
-50 dBm	-2	+2
-60 dBm	-2	+2
-70 dBm	-2	+2

-80 dBm	-2	+2
Ref Freq 1842.5 MHz		
Hop Frequencies 1805.2 – 1879.8 MHz		
-30 dBm	-2	+2
-40 dBm	-2	+2
-50 dBm	-2	+2
-60 dBm	-2	+2
-70 dBm	-2	+2
-80 dBm	-2	+2
Ref Freq 1960 MHz		
Hop Frequencies 1930.2 – 1989.8 MHz		
-30 dBm	-2	+2
-40 dBm	-2	+2
-50 dBm	-2	+2
-60 dBm	-2	+2
-70 dBm	-2	+2
-80 dBm	-2	+2
Ref Freq 2140 MHz		
Hop Frequencies 2109.9 – 2170.1 MHz		
-30 dBm	-2	+2
-40 dBm	-2	+2
-50 dBm	-2	+2
-60 dBm	-2	+2
-70 dBm	-2	+2
-80 dBm	-2	+2

ANITE BER Residual

Overview:

This procedure tests the Residual Bit Error Rate of the DUT's analyzer.

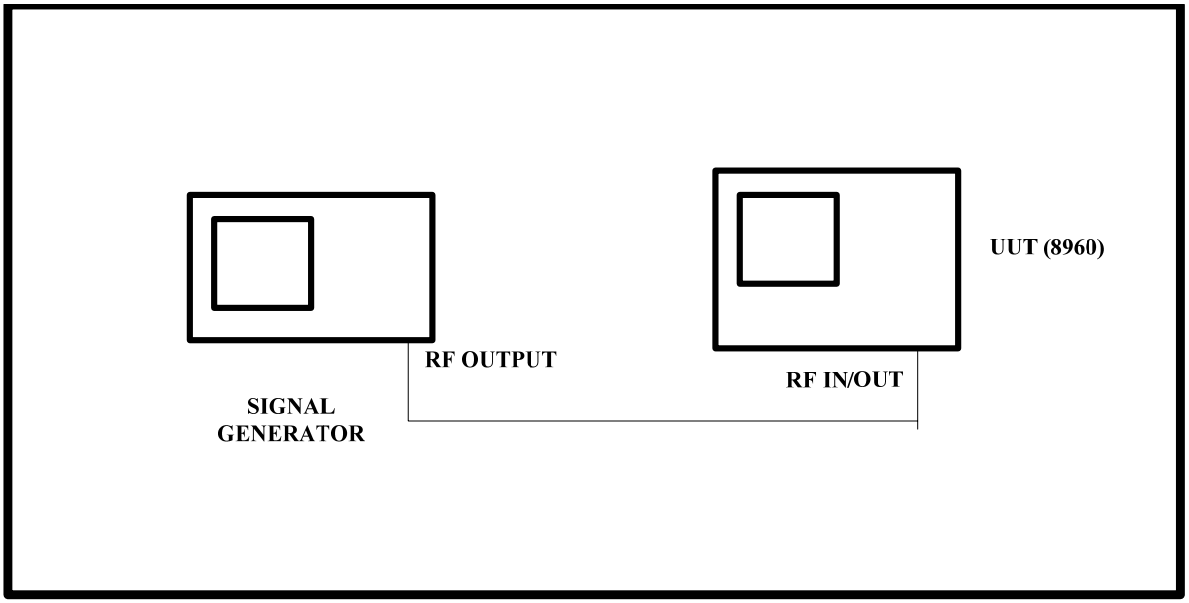
Recommended Test Equipment:

- Agilent ESG series Signal Generator

Connect ID:

- ESG CONNECT

Setup:



Note: Connect the time-bases together. Connect the signal generator PATTERN TRIG IN to the 8960's TRIGGER INPUT.

Test Methodology:

An arbitrary waveform is generated from the ESG setup for the worst case scenario. The DUT is set at 1909.8 MHz the source generates at 700 Hz offset from this frequency. The DUT expected power level is set at -18dBm, the low end of its specification, and the source is generation -28 dBm. The DUT will measure 1.25E+8 bits from the ESG. The specification is $<2x10^{-8}$